CARBON MONOXIDE REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

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MARICOPA ASSOCIATION of GOVERNMENTS

CARBON MONOXIDE REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

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CARBON MONOXIDE REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

EXECUTIVE SUMMARY

CARBON MONOXIDE REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

EXECUTIVE SUMMARY

The Maricopa Association of Governments (MAG) is requesting that the U.S. Environmental Protection Agency (EPA) redesignate the Maricopa County nonattainment area to attainment for the National Ambient Air Quality Standards for carbon monoxide. The area was designated a nonattainment area for carbon monoxide in April 1977, but no violations of the standards have occurred since 1996. With the submittal of this redesignation request and maintenance plan, the Maricopa County nonattainment area has satisfied all of the requirements for redesignation to attainment for carbon monoxide.

Under the 1990 Clean Air Act Amendments, the nonattainment area was classified as a Moderate Area for carbon monoxide. The MAG 1993 Carbon Monoxide Plan, addressing the Moderate Area requirements, was submitted to the Environmental Protection Agency (EPA) in November 1993. An Addendum to this Moderate Area plan was submitted to EPA in March 1994. In July 1996, the nonattainment area was reclassified to Serious due to a failure to attain the eight-hour carbon monoxide standard by December 31, 1995. The MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area was submitted to EPA in July 1999.

In 2000, the Arizona Legislature passed House Bill 2104, which repealed the Random Onroad Testing Requirements from the Vehicle Emissions Inspection program. MAG conducted new air quality modeling and documented the impact of the repeal of this program in the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area. The Revised MAG Serious Area Carbon Monoxide Plan was submitted to EPA in April 2001.

The Environmental Protection Agency has indicated that approval of the Revised MAG 1999 Serious Area Carbon Monoxide Plan will occur in 2003. If the Plan is not approved before this redesignation request is submitted to EPA, the Serious Area Carbon Monoxide Plan and redesignation request can be approved simultaneously.

The Clean Air Act defines the following criteria that must be met before a nonattainment area can be redesignated to attainment:

EPA must fully approve the Revised MAG 1999 Serious Area Carbon Monoxide Plan and any related State Implementation Plan (SIP) components.
EPA must determine that the area has attained the carbon monoxide standards.
EPA must determine that the improvement in air quality is due to permanent and enforceable reductions in emissions.
The State must meet all applicable requirements for State Implementation Plans (SIPs) and Nonattainment Areas as defined in the Clean Air Act.
EPA must approve a maintenance plan for the area. The plan must demonstrate maintenance of the carbon monoxide standard for a period of at least ten years following the redesignation to attainment by EPA.

As indicated above, it is anticipated that the Revised MAG 1999 Serious Area Carbon Monoxide Plan will be approved by EPA in 2003. Chapter Two of this document provides monitoring data to support the finding that the carbon monoxide standards have been met in the nonattainment area since 1996. Figure ES-1 shows the continuous downward trend in the second-highest carbon monoxide concentration occurring in the nonattainment area. Chapter Two demonstrates that these improvements in air quality are attributable to permanent, enforceable reductions in carbon monoxide emissions. The second chapter also documents that other Clean Air Act requirements for SIPs and nonattainment areas have been met.

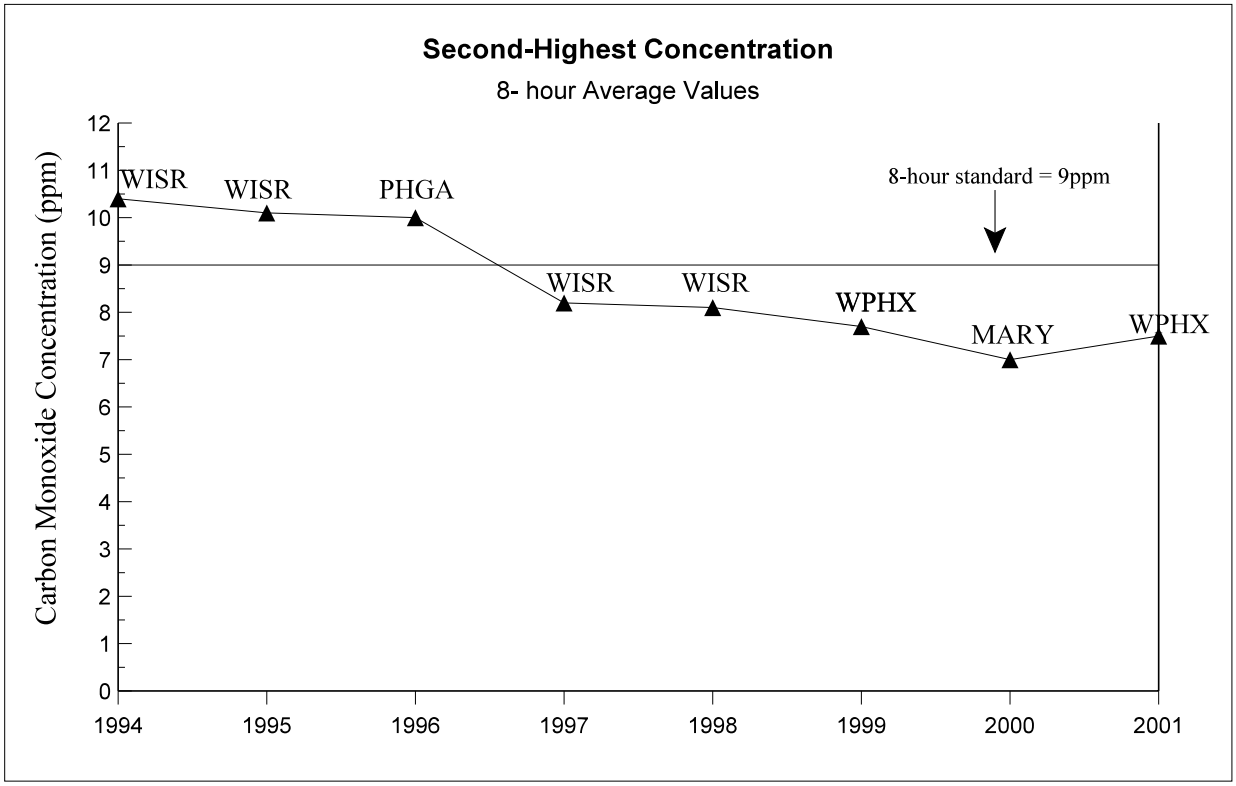
Generally, the overall approach taken in preparing the Maintenance Plan is to demonstrate maintenance of the carbon monoxide standard in 2015 with the committed measures in the Revised MAG 1999 Serious Area Carbon Monoxide Plan. Therefore, the Maintenance Plan relies heavily upon the Revised MAG 1999 Serious Area Carbon Monoxide Plan and its supporting documents, including the commitments to implement control measures.

Chapter Three contains the Carbon Monoxide Maintenance Plan for the nonattainment area. The Maintenance Plan shows that the area will continue to maintain the eight-hour standard through 2015, a period of at least ten years following redesignation to attainment by EPA. Maintenance of the standard through 2015 will be achieved, despite growth in regional population, employment, and vehicle travel, due to more stringent federal controls on vehicles and fuels, and state and local committed measures in the Maintenance Plan.

Table ES-1 identifies the base case control measures for which numeric credit was taken in validating the air quality models for 1994. The nine committed maintenance measures for which numeric credit is taken in the Maintenance Plan are also identified in Table ES-2. All nine of these were also committed measures in the Revised MAG 1999 Serious Area Carbon Monoxide Plan. In the Serious Area Plan, six were attainment measures, two were contingency measures, and Off-road Vehicle and Engine Standards was not quantified, because the standards had not been adopted at the time the plan was submitted.

Table ES-2 compares total carbon monoxide emissions in the 1994 base case to emissions in 2015 with the committed maintenance measures. The maximum eight-hour carbon monoxide concentration modeled in 1994 was 10.71 parts per million (ppm). The maximum eight-hour concentration in 2015 is projected to be 8.06 ppm, or ten percent below the standard of 9 ppm.

FIGURE ES-1
CARBON MONOXIDE TRENDS
(1994-2001)



Monitor Where Second-Highest Reading Occurred

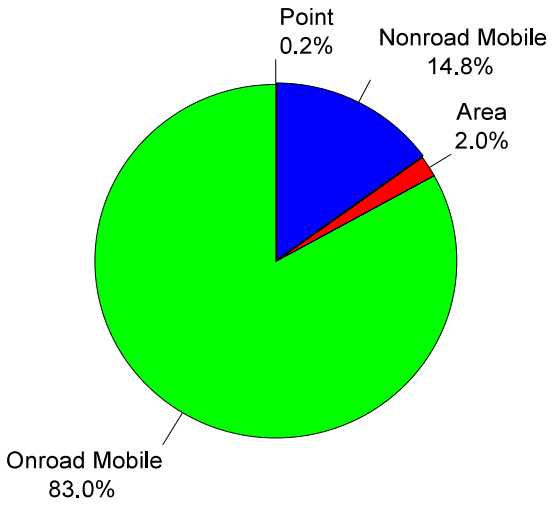
WISR = West Indian School Road
PHGA = Phoenix Grand Avenue
WPHX = West Phoenix
MARY = Maryvale

TABLE ES-1
1994 BASE CASE AND 2015 COMMITTED MAINTENANCE MEASURES

Base Case Measures Assumed in the 1994 Model Validation for the Carbon Monoxide Maintenance Plan	Committed Maintenance Measures Used for Credit in the Carbon Monoxide Maintenance Plan
1. Inspection/Maintenance (I/M) idle test was required for all gasoline vehicles	1. CARB Phase 2 with 3.5% Oxygenate in Winter
2. I/M waiver rates of 10% assumed for pre-1981 model year vehicles and 4%, for 1981 and newer vehicles	2. Phased-In Emission Test Cutpoints
3. Oxygenate content and Reid Vapor Pressure (RVP) were based on actual fuel properties from surveys	3. One-Time Waiver from Vehicle Emissions Test
4. Vehicles participating in I/M test - 88%; not-participating - 12%	4. Defer Emissions Associated with Government Activities
	5. Coordinate Traffic Signal Systems
	6. Develop Intelligent Transportation Systems
	7. Tougher Enforcement of Vehicle Registration and Emission Test Compliance
	8. Clean Burning Fireplace Ordinances
	9. Off-Road Vehicle and Engine Standards

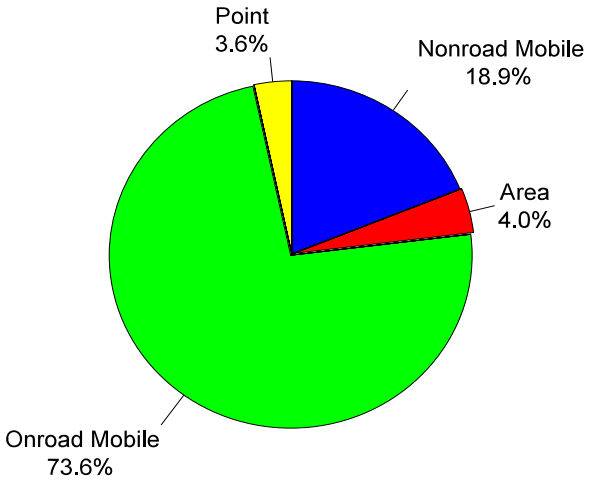
TABLE ES-2
1994 BASE CASE AND 2015 COMMITTED MAINTENANCE MEASURE EMISSIONS

Friday, December 1994		
Source Category	Metric Tons per Day	Percent
Point	2.5	0.2
Area	21.0	2.0
Nonroad Mobile	155.1	14.8
Onroad Mobile	869.6	83.0
Total	1048.2*	100.0*



December 1994

Friday, December 2015		
Source Category	Metric Tons per Day	Percent
Point	32.2	3.6
Area	36.2	4.0
Nonroad Mobile	169.9	18.9
Onroad Mobile	662.9	73.6
Total	901.2*	100.0*



December 2015

* Note that the sum of the source categories may not equal 100.0 percent due to rounding.

Point Sources - Industrial, Manufacturing, and Electrical Power Generation Facilities

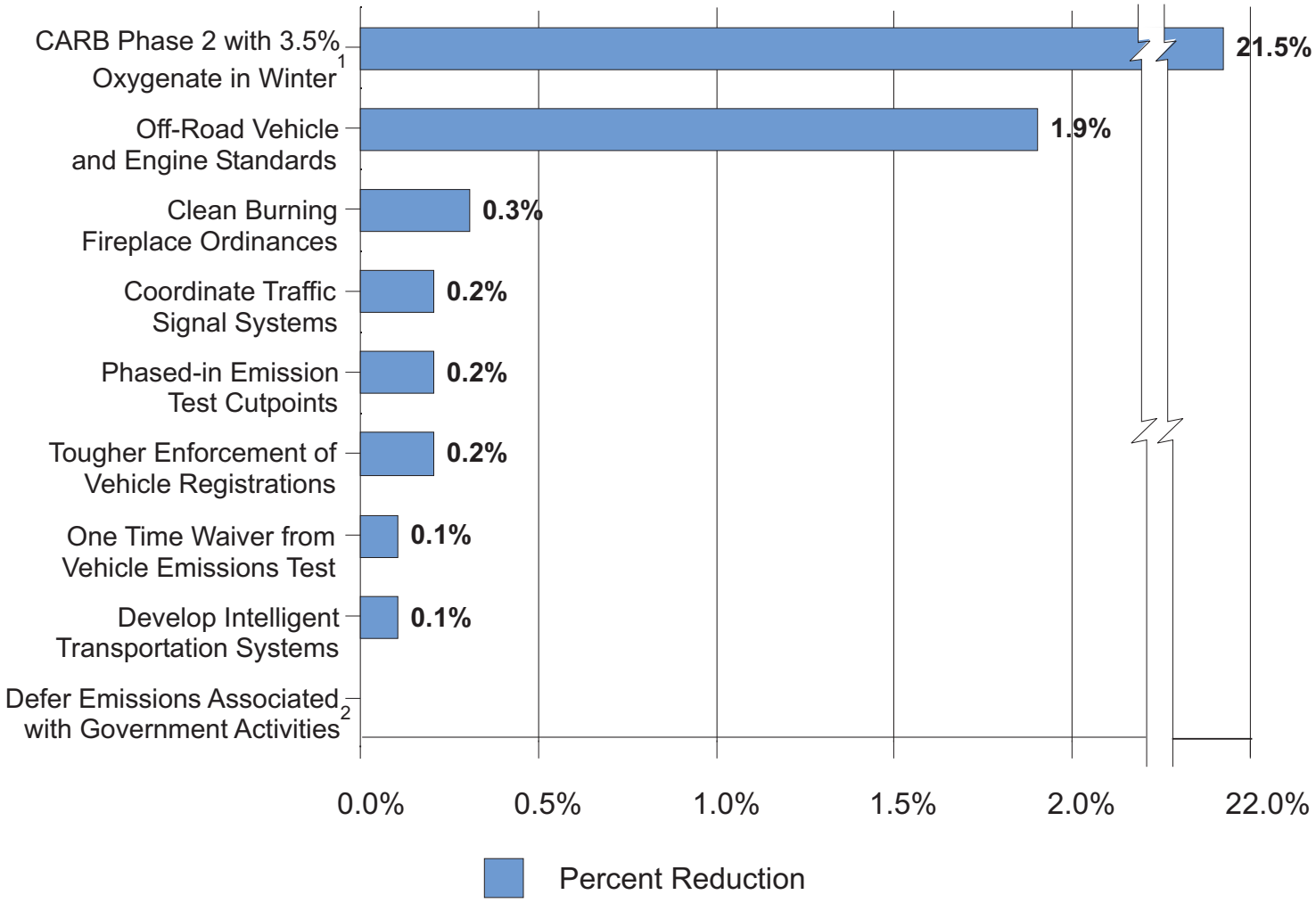
Area Sources - Residential Wood and Industrial Fuel Combustion, On-site Incineration, and Open Burning

Nonroad Mobile - Utility, Lawn & Garden, Construction, Farm, and Recreational Equipment, Aircraft and Locomotives

Figure ES-2 illustrates the emissions reduction attributable to each of the maintenance measures in 2015. With the committed measures, the Maintenance Plan projects that onroad mobile sources will contribute about 73.6 percent of the total carbon monoxide emissions in 2015 or 662.9 metric tons per day. This figure, 662.9 metric tons per day, represents the motor vehicle emissions conformity budget for carbon monoxide in 2015. In addition, the Maintenance Plan establishes an interim conformity budget for carbon monoxide of 699.7 metric tons per day in 2006.

The Clean Air Act also requires that a maintenance plan contain contingency provisions. The maintenance plan is not required to contain fully adopted contingency measures. Chapter Three identifies three contingency measures that were also contingency measures in the Revised MAG 1999 Serious Area Carbon Monoxide Plan. These measures have already been adopted and implemented in the nonattainment area. Early implementation of contingency measures is allowed by EPA. The contingency measures in this Maintenance Plan are: Expansion of Area A Boundaries, Gross Polluter Option for I/M Program Waivers, and Increase Waiver Repair Limit Options. Figure ES-3 illustrates the emission reductions attributable to each of these contingency measures in 2000. Chapter Three also describes the process and schedule to be followed if monitoring data indicate additional measures are needed in the future.

FIGURE ES-2
2015 CARBON MONOXIDE EMISSION REDUCTIONS FROM INDIVIDUAL MAINTENANCE MEASURES
(Percent Reduction in Total Emissions)

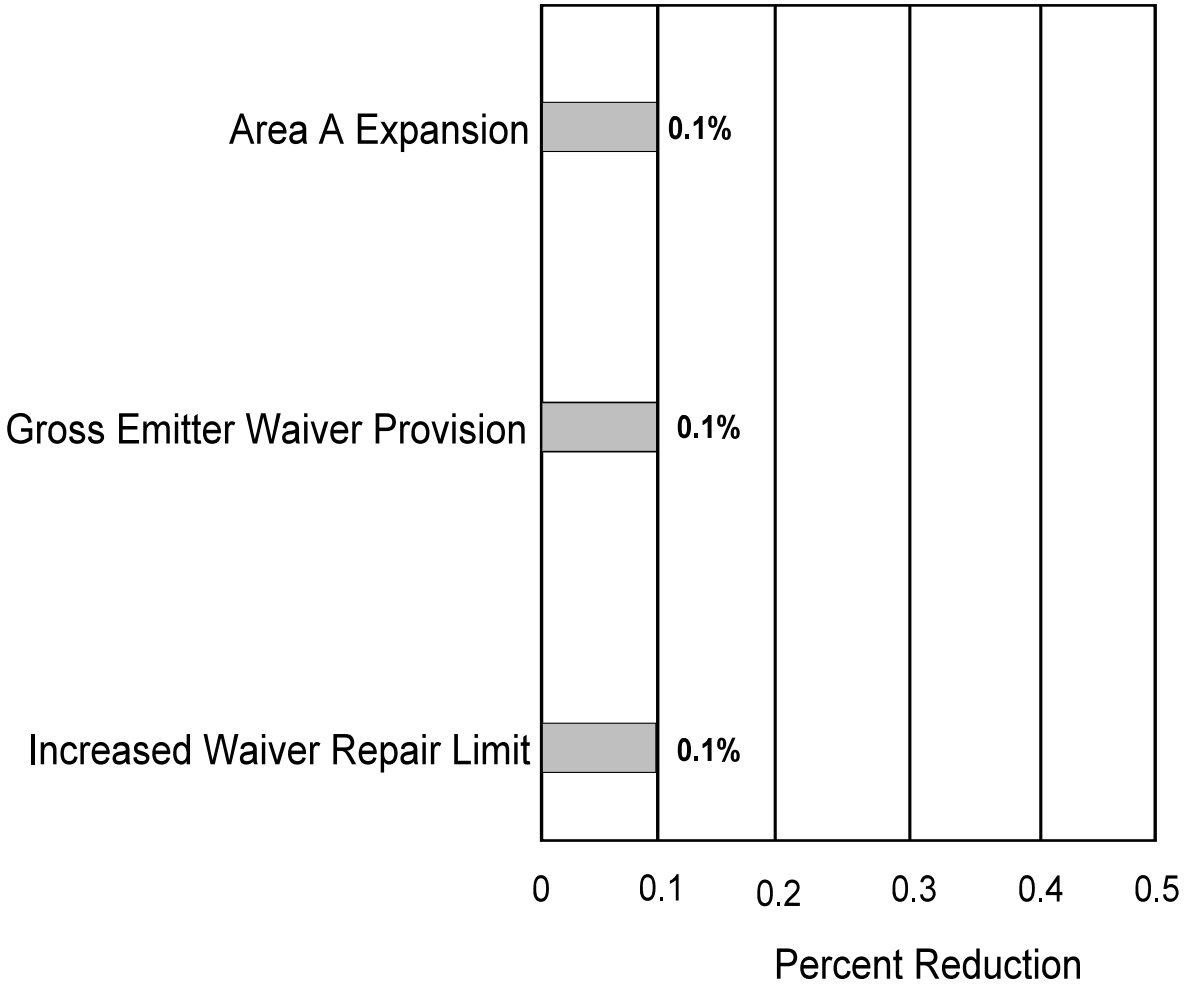


[1]Of the 21.5 percent reduction in emissions, the majority (21.1 percent) is due to the low sulfur content of the fuel.

[2]This measure influences when emissions occur rather than their magnitude; 6 percent of emissions from two-stroke gasoline-powered engines used by public agencies were shifted from post-2 p.m. period to the pre-2 p.m. period on the modeled week day.

NOTE: Individual impact of measures are not additive.

FIGURE ES-3
CARBON MONOXIDE EMISSION REDUCTIONS
FROM INDIVIDUAL CONTINGENCY MEASURES IN 2000
(Percent Reduction in Total Emissions)



CHAPTER ONE

INTRODUCTION

The Maricopa Association of Governments (MAG) is requesting that the U.S. Environmental Protection Agency (EPA) redesignate the Maricopa County nonattainment area to attainment for the National Ambient Air Quality Standards for carbon monoxide. The area was designated a nonattainment area for carbon monoxide in April 1977, but has not violated the standard since 1996. Therefore, the area is now eligible for redesignation. Chapter Two contains the formal redesignation request and supporting documentation. Chapter Three provides the Maintenance Plan which demonstrates continued attainment of the carbon monoxide standard through the year 2015.

In 1978, the Governor of Arizona designated the Maricopa Association of Governments as the lead air quality planning agency for Maricopa County. Together with the State, MAG is responsible for determining which elements of the State Implementation Plan will be planned, implemented and enforced by State and local governments in Arizona. In 1992, the Arizona Legislature recertified MAG as the regional air quality planning agency. MAG coordinates with the Arizona Department of Environmental Quality, Arizona Department of Transportation and the Maricopa County Environmental Services Department in developing the plans necessary to attain and maintain the national standards.

This redesignation request and Maintenance Plan have been reviewed and approved by the MAG Air Quality Technical Advisory Committee, the MAG Management Committee, and the MAG Regional Council. The MAG Air Quality Technical Advisory Committee was established in 1995 with representatives from State, county and local governments, private industry, environmental groups, and the public-at-large. The Air Quality Technical Advisory Committee makes recommendations to the MAG Management Committee on air quality plans, projects, funding and other pertinent issues.

The MAG Management Committee is comprised of managers from each of the MAG member agencies that include twenty-five cities and towns, the Salt River Pima-Maricopa and Gila River Indian Communities, Maricopa County, and the Arizona Department of Transportation. The MAG Management Committee makes recommendations to the MAG Regional Council. The Regional Council is the MAG decision-making body and is composed of elected officials from the MAG member agencies.

MAG has also conducted a public hearing on this redesignation request and maintenance plan in accordance with federal requirements. All public comments and responses are provided in the Appendix.

NATIONAL AMBIENT AIR QUALITY STANDARDS FOR CARBON MONOXIDE

There are two federal standards for carbon monoxide (CO): an eight-hour standard of 9 parts per million (ppm) and a one-hour standard of 35 ppm. A violation occurs when two or more exceedances of the standard are recorded at the same monitoring site during a calendar year. An exceedance is considered as a monitored value of 9.5 ppm (or 35.5 ppm) or greater.

The last exceedance of the one-hour carbon monoxide standard in the nonattainment area was recorded in 1984. There has been only one exceedance of the eight-hour CO standard since 1996; this occurred at the Phoenix Grand Avenue monitor in 1999. Since only one exceedance occurred at that site in 1999, the standard was not violated. There were no exceedances of the eight-hour carbon monoxide standard at any of the fifteen carbon monoxide monitors located in the nonattainment area in 1997, 1998, 2000 and 2001. There have been no violations of the eight-hour carbon monoxide standard since 1996.

CHARACTERISTICS AND HEALTH EFFECTS OF CARBON MONOXIDE

Carbon monoxide is produced by the incomplete combustion of carbon contained in fossil fuels. Most carbon monoxide is emitted from tailpipes of on-road and non-road motor vehicles. Some is a by-product of commercial and residential heating. Peak concentrations typically occur along roadways and near intersections with high levels of traffic congestion. Calm winds during the late fall and winter, coupled with night and early morning ground-based temperature inversions, can cause a build-up of CO concentrations in urban areas.

Carbon monoxide is a colorless, odorless and tasteless gas. When inhaled, CO enters the lungs and is absorbed by the hemoglobin in the body's red blood cells. By displacing oxygen in the hemoglobin, carbon monoxide reduces the flow of oxygen to human organs, tissues and the central nervous system. Prolonged exposure at high concentrations poses the greatest risk to young people, pregnant women, and those with cardiovascular or pulmonary disease. Common symptoms of carbon monoxide poisoning are dizziness, headaches, fatigue, visual impairment and disorientation. Healthy individuals can also experience detrimental effects from carbon monoxide, such as a reduced ability to concentrate.

NONATTAINMENT AREA

The Maricopa County carbon monoxide nonattainment area encompasses approximately 2,000 square miles in central Arizona. The northern boundary of the nonattainment area is located approximately six miles north of Carefree Highway and the southern boundary, generally along Hunt Highway. To the east, the area is bounded by the Pinal County Line and the Tonto National Forest; on the west, by Jackrabbit Trail and Beardsley Canal. The area contains portions of twenty-two cities and towns, the Fort McDowell, Gila River and

Salt River Pima-Maricopa Indian Communities, and some unincorporated areas of Maricopa County. According to the U.S. Census, the population of Maricopa County in 2000 was 3.1 million. Most of these residents live and work within the nonattainment area boundaries.

The nonattainment area is located in the Salt River Valley at 1,100 feet above mean sea level and is almost completely surrounded by mountains. The climate in the nonattainment area is arid continental, with temperatures ranging from a mean of 52 degrees Fahrenheit in January to 91 degrees, in July. The sun shines 86 percent of the time and the annual rainfall is about 7.44 inches. In general, the prevailing wind direction is from E/SE to W/SW, although the winds can shift in the afternoon to a more westerly direction.

HISTORY

In accordance with the Clean Air Act, an urbanized portion of Maricopa County was formally designated as a nonattainment area for carbon monoxide in April 1977. Under the 1990 Clean Air Act Amendments, the nonattainment area was classified as Moderate for carbon monoxide. In order to meet the Moderate area requirements, the MAG 1993 Carbon Monoxide Plan was submitted to the Environmental Protection Agency by November 15, 1993. An Addendum to this Plan was submitted in March 1994. On July 29, 1996, the nonattainment area was reclassified to Serious due to failure to attain the carbon monoxide standard by December 31, 1995. The Serious Area reclassification was effective on August 28, 1996.

On July 8, 1999, the Arizona Department of Environmental Quality submitted the MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area to EPA. A completeness finding was issued by EPA on September 9, 1999.

Following the submission of this Plan, the Arizona Legislature passed House Bill 2104 during the 2000 regular session, which repealed the Random Onroad Testing Requirements (Remote Sensing Program) from the Vehicle Emissions Inspection Program. EPA then indicated that the Serious Area Carbon Monoxide Plan that had been submitted, including the attainment demonstration for December 2000, would need to be revised to reflect the repeal of the Remote Sensing Program. In response, MAG conducted new air quality modeling and documented the impact of the repeal of the Remote Sensing Program in the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area, dated March 2001.

On April 18, 2001, the Arizona Department of Environmental Quality submitted the Revised MAG Serious Area Carbon Monoxide Plan to EPA. A completeness finding was issued by EPA on October 9, 2001. While this latest SIP has not been approved under section 110(k), it is anticipated that EPA approval will occur before this request for redesignation is submitted. If not, approval action on SIP elements of the Revised Serious Area Carbon Monoxide Plan and the redesignation request may occur simultaneously.

REQUIRED COMPONENTS OF A REDESIGNATION REQUEST

Sections 107(d)(3)(D) and (E) of the Clean Air Act define the criteria that must be met before an area can be redesignated to attainment. With the submittal of this redesignation request and maintenance plan, the Maricopa County nonattainment area meets the five required criteria, summarized below:

1. Attainment of the Standard

Chapter Two shows that the area has attained the national standards for carbon monoxide.

2. State Implementation Plan Approval

EPA issued a completeness finding on the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area in October 2001. Approval of this plan is expected in 2003.

3. Improvement in Air Quality Due to Permanent and Enforceable Emission Reductions

Chapter Two discusses the evidence that the improvement in air quality leading to attainment and maintenance of the standards has been due to permanent and enforceable emissions reductions.

4. Clean Air Act Section 110 and Part D Requirements

Chapter Two discusses how requirements of Clean Air Act Section 110 (for SIPs) and Part D (for nonattainment areas) are satisfied by the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area and the Maintenance Plan provided in Chapter Three of this document.

5. Maintenance Plan

Chapter Three contains the Maintenance Plan for the Maricopa County carbon monoxide nonattainment area. The Maintenance Plan demonstrates that the area will continue to maintain the eight-hour carbon monoxide standard through 2015, a period of at least ten years following redesignation to attainment by EPA. The Maintenance Plan also contains contingency measures that have been implemented and describes the process and schedule that will be used to consider additional measures, if eight-hour carbon monoxide concentrations of 9.0 ppm or more are recorded at two or more monitoring sites in a future calendar year.

CHAPTER TWO

REDESIGNATION REQUEST

The Maricopa Association of Governments (MAG) requests that the U.S. Environmental Protection Agency (EPA) redesignate the Maricopa County nonattainment area to attainment for the National Ambient Air Quality Standards for carbon monoxide. The area was designated a carbon monoxide nonattainment area in April 1977, but has not violated the standard since 1996. Therefore, the area is eligible for redesignation.

REQUIRED COMPONENTS OF A REDESIGNATION REQUEST

The EPA Administrator may not redesignate an area to attainment, unless the following requirements of Section 107(d)(3)(E) of the Clean Air Act (CAA) are met. These four requirements for redesignation are discussed in this chapter.

1. The Administrator determines that the area has attained the national ambient air quality standards.

2. The Administrator has fully approved the applicable implementation plan under Section 110(k).

3. The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions.

4. The State has met all applicable requirements under Section 110 and Part D.

A fifth requirement for redesignation to attainment is that:

5. The EPA Administrator approve a maintenance plan for the area that meets the provisions of Section 175A.

Chapter Three contains the maintenance plan that is being submitted to EPA to fulfill this fifth and final requirement.

ATTAINMENT OF THE CARBON MONOXIDE STANDARDS

Attainment of the National Ambient Air Quality Standards for carbon monoxide is demonstrated when two consecutive years of monitoring data for each site show no more than one exceedance per year of the 8-hour (9 ppm) and 1-hour (35 ppm) standards. The following information demonstrates, as required by Section 107(d)(3)(E) of the Clean Air Act, that the Maricopa County nonattainment area has attained the national standards for carbon monoxide. This is based on quality assured monitoring data representing all monitoring locations in the nonattainment area, including two microscale monitors that record the highest carbon monoxide concentrations in the region.

Historical Perspective

Data from the regional monitoring network and two microscale monitoring sites indicate that the Maricopa County nonattainment area has not violated the eight-hour standard for carbon monoxide (CO) since 1996. The last exceedance of the one-hour standard was recorded in 1984. In addition, both the frequency of exceedance days and the magnitude of observed CO concentrations have declined dramatically since air quality monitoring began in the late 1960's.

In contrast to the lack of eight-hour violations since 1996, eighty-six exceedance days were recorded in 1984. There was a noticeable decline in the number of exceedance days from 1984 through 1990. In 1994 through 1996 period, there were a total of eight exceedance days, three each in 1994 and 1995, and two in 1996. There were two violation sites in 1994 (West Indian School and West Phoenix sites), and one each in 1995 and 1996 (both at the Phoenix Grand Avenue site). There were no exceedances of the standard at any site in 1997,1998, 2000, 2001 or 2002. There was a single exceedance of the eight-hour standard in 1999 at the Phoenix Grand Avenue site, but this one exceedance did not constitute a violation of the standard.

The carbon monoxide concentrations measured by the regional monitoring network indicate that steady progress toward attainment has been achieved over the past 30 years. Since 1990, the two microscale monitors (Phoenix Grand Avenue and West Indian School) have recorded the highest carbon monoxide concentrations and the majority of the exceedances in the nonattainment area. The West Indian School monitor commenced operation in 1981 near the intersection of 35th Avenue, Grand Avenue, and Indian School Road. This station recorded 69 exceedance days in its first year of operation. The number of exceedance days at the site has decreased steadily since then, to the point where only three were recorded in 1994, one in 1995, and none since 1996. The annual eight-hour maximum concentration at the West Indian School site has declined by two-thirds, from 20.3 ppm in 1981 to 6.8 ppm in 2001.

It is important to examine monitoring data for spatial and temporal trends, in order to gain a better understanding of the conditions most likely to result in an exceedance. All of the exceedances during the 1994 to 1996 period were recorded at four monitoring sites, located in the west-central portion of the nonattainment area. Three of the four sites are within 1.5 miles of one another. The majority of the exceedance days occurred in December, with occasional exceedances in November and January, and half of the exceedance days occurred on Saturday. All recorded eight-hour exceedance periods ended between 0100 and 0400 hours. The highest hourly concentrations were monitored between 2100 and 2400 hours on the days prior to the recorded exceedances.

These data suggest that the highest carbon monoxide readings in the region continue to occur during winter inversion conditions. These inversions cause a layer of warmer air aloft to trap the cold air near the ground surface and effectively eliminate convective circulation. As a result of the inversion conditions, the pollutants normally dispersed by mixing

accumulate beneath the lid of warm air. After sunrise, the ground surface is reheated and the inversion rapidly breaks down. The temperature of the lower atmosphere increases as the warm air rises and the pollutants are then dispersed through natural vertical mixing.

Most of the carbon monoxide trapped by the inversion layer is emitted by vehicular traffic during the afternoon and evening before the high concentration is observed. The fact that the highest CO readings are now well below the standard indicates that motor vehicle emissions have declined dramatically over the past 30 years, due to the Federal Motor Vehicle Emission Standards and other control measures included in the Revised 1999 MAG Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area, March 2001 (Revised Serious Area Carbon Monoxide Plan).

Carbon Monoxide Monitoring Network

The ambient air monitoring network for carbon monoxide in the Maricopa County nonattainment area consists of three National Air Monitoring Stations (NAMS), nine State and Local Air Monitoring Stations (SLAMS), and three Special Purpose Monitors (SPM) operated by the Maricopa County Environmental Services Department and the Arizona Department of Environmental Quality. The CO monitoring sites are identified, along with summary data from 1998 through 2001, in Tables 2-1 through 2-4. Figure 2-1 shows the geographical distribution of the regional monitoring network.

Monitoring Results and Attainment Demonstration

The monitoring data presented in Tables 2-1 through 2-4 verify that the Maricopa County nonattainment area has been in attainment of the national standards for carbon monoxide since 1997, as well as for the most recent two-year period (2000-2001), in accordance with the federal requirements of 40 CFR 50.8. Data recovery rates for the monitors exceed the 75 percent completeness requirements for all years and all state and federal quality assurance procedures have been followed. Figure 2-2 illustrates the continuous downward trend in the second-highest carbon monoxide concentrations at all monitors in the nonattainment area.

Quality Assurance Program

Carbon monoxide data for the Maricopa County area has been collected and quality-assured in accordance with 40 CFR, Part 58, Appendix A, EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II; Ambient Air Specific Methods", the Maricopa County Ambient Air Monitoring Program QA/QC Procedures, and the ADEQ Quality Assurance Project Plan. The data are recorded in the EPA Aerometric Information Retrieval System (AIRS) and are also available for public review in air quality monitoring reports produced annually by the Maricopa County Environmental Services Department and the Arizona Department of Environmental Quality.

TABLE 2-1

1998 CARBON MONOXIDE MONITORING DATA SUMMARY FOR THE MARICOPA COUNTY NONATTAINMENT AREA STANDARDS: 1-HOUR: 35 PPM; 8-HOUR: 9 PPM*

Site Name	1-Hour		8-Hour	
	Max ppm	2nd Max ppm	Max ppm	2nd Max ppm
West Chandler, 163 S. Price Rd.**	4.1	4	2.9	2.9
Gilbert, 535 N. Lindsay Rd.	3.5	3.3	2.7	2.7
Glendale, 6000 W. Olive	5	4.9	3.4	3.3
Mesa, 370 S. Brooks	6.5	6.1	4.4	4.3
South Phoenix, 4732 S. Central	8.2	7.9	5.4	5.4
Central Phoenix, 1845 E. Roosevelt	9.1	8.9	7.1	7.1
North Phoenix, 601 E. Butler	8	7.3	6.1	5.9
West Indian School, 3315 W. Indian School	9.7	9.4	8.1	8.1
West Phoenix, 3847 W. Earll	10.7	9.6	7.7	7.7
Phoenix Post Office, 3905 N. 7th Ave.	9.4	9.3	8.2	6.9
Phoenix Grand Ave., 27th Ave/Grand/Thomas[S]	10.7	9.6	7.3	6.8
JLG Supersite, 4530 N. 17th Ave. [S]	9.6	8.9	7.2	6.6
Greenwood, I-10 and 27th Ave.	9.4	8.9	7.5	7.3
Maryvale, 6180 W. Encanto	7.5	7.5	6.1	6.1
South Scottsdale, 2857 N. Miller	5.5	5.2	3.7	3.6

* Due to mathematical rounding, values $\geq$ 35.5 and 9.5 ppm are necessary to exceed the standard.

**The West Chandler monitor was moved to Frye Rd. and Ellis in 1999.

[S] Seasonal monitor operating from January to March and October to December.

TABLE 2-2

1999 CARBON MONOXIDE MONITORING DATA SUMMARY FOR THE MARICOPA COUNTY NONATTAINMENT AREA STANDARDS: 1-HOUR: 35 PPM; 8-HOUR: 9 PPM*

Site Name	1-Hour		8-Hour	
	Max ppm	2nd Max ppm	Max ppm	2nd Max ppm
West Chandler, Frye Rd. & Ellis ** S	4.3	4	2.9	2.8
Gilbert, 535 N. Lindsay Rd. S	3.8	3.7	2.4	2.4
Glendale, 6000 W. Olive S	5.7	5.3	3.8	3.4
Mesa, 370 S. Brooks S	7.2	5.8	4.4	4
South Phoenix, 4732 S. Central, (Closed Aug-Nov)	7.8	7.7	4.6	4.4
Central Phoenix, 1845 E. Roosevelt	11.3	9.3	7.2	5.9
North Phoenix, 601 E. Butler S	7.8	6.3	3.5	3.5
West Indian School, 3315 W. Indian School	11.8	11.7	7.6	7.5
West Phoenix, 3847 W. Earll	12.3	11.9	7.7	7.4
Phoenix Post Office, 3905 N. 7th Ave. (Closed 4/1)	8.5	7.4	5.8	5.7
Phoenix Grand Ave., 27th Ave/Grand/Thomas S	18.4	13.4	10.5	8
JLG Supersite, 4530 N. 17th Ave.	8.5	8.2	7	6.6
Greenwood, I-10 and 27th Ave.	10.8	9.5	6.7	6.6
Maryvale, 6180 W. Encanto S	9.7	9	7.2	6.6
South Scottsdale, 2857 N. Miller S	6	5.8	4.3	4.1

* Due to mathematical rounding, values $\geq$ 35.5 and 9.5 ppm are necessary to exceed the standard.

** The West Chandler monitor was operated at 163 S. Price Rd. from January through March 1999 and at its present location from October through December 1999.

S Seasonal monitor operating from January to March and October to December.

TABLE 2-3

2000 CARBON MONOXIDE MONITORING DATA SUMMARY FOR THE MARICOPA COUNTY NONATTAINMENT AREA STANDARDS: 1-HOUR: 35 PPM; 8-HOUR: 9 PPM*

Site Name	1-Hour		8-Hour	
	Max ppm	2nd Max ppm	Max ppm	2nd Max ppm
West Chandler, Frye Rd. & Ellis [S]	5.7	3.8	2.5	2.3
Gilbert, 535 N. Lindsay Rd. [S #]	3.7	3.3	2	2
Glendale, 6000 W. Olive [S]	4.6	4.6	3.5	3.2
Mesa, 370 S. Brooks [S]	6	5.1	4.3	3.4
South Phoenix, 4732 S. Central [S]	10	8.4	5.9	4.7
Central Phoenix, 1845 E. Roosevelt	8.1	8	5.3	5
North Phoenix, 601 E. Butler [S]	6	5.9	3.1	3.1
West Indian School, 3315 W. Indian School	11.9	8.9	6.8	6.7
West Phoenix, 3847 W. Earll	10.6	10.4	7.4	7.2
Phoenix Grand Ave., 27th Ave/Grand/Thomas[S]	10.5	10.5	6	6
JLG Supersite, 4530 N. 17th Ave.	9.1	7.9	6.9	6.4
Greenwood, I-10 and 27th Ave.	8.1	8.1	5.6	5.6
Maryvale, 6180 W. Encanto [S]	9.3	9.1	7	7
South Scottsdale, 2857 N. Miller [S]	5	4.9	3.3	3.1
Tempe, College Av., N. of Daily Park [#]	5	4.6	3.7	3.5

* Due to mathematical rounding, values $\geq$ 35.5 and 9.5 ppm are necessary to exceed the standard.
[#] Less than 75 percent data recovery available in one or more calendar quarters.
[S] Seasonal monitor operating from January to March and October to December.

TABLE 2-4

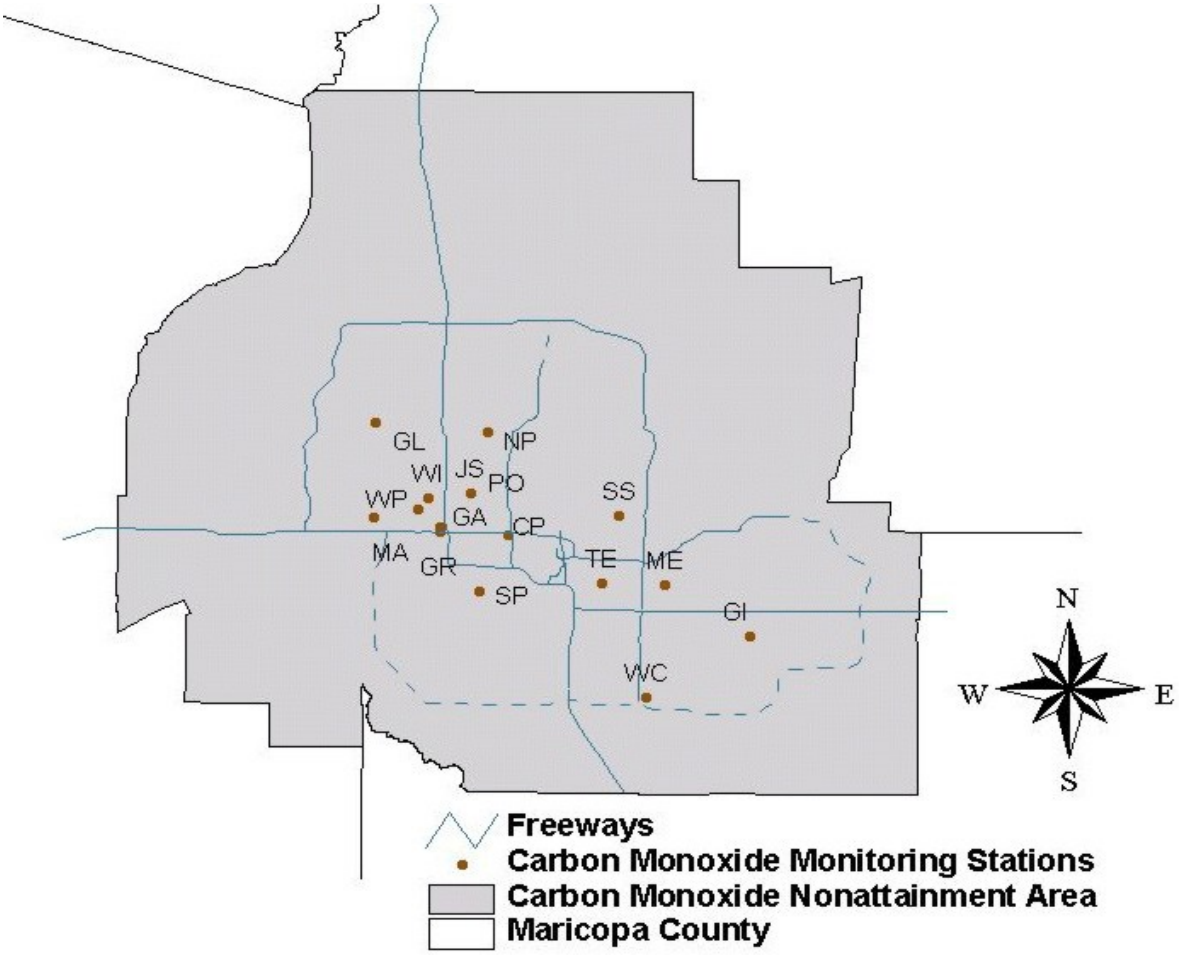
2001 CARBON MONOXIDE MONITORING DATA SUMMARY FOR THE MARICOPA COUNTY NONATTAINMENT AREA STANDARDS: 1-HOUR: 35 PPM; 8-HOUR: 9 PPM*

Site Name	1-Hour		8-Hour	
	Max ppm	2nd Max ppm	Max ppm	2nd Max ppm
West Chandler, Frye Rd. & Ellis [S]	3.3	3.1	2.2	2.1
Surprise, 18600 N. Reems Rd. [S]	2.6	2.5	1.2	1
Glendale, 6000 W. Olive [S]	4.7	4.7	3.1	2.8
Mesa, 370 S. Brooks [S]	4.6	3.8	2.9	2.6
South Phoenix, 4732 S. Central [S]	6.8	6.3	4.5	3.4
Central Phoenix, 1845 E. Roosevelt	6	5.8	4.8	4.2
North Phoenix, 601 E. Butler [S]	5.2	4.7	2.5	2.5
West Indian School, 3315 W. Indian School	8	7.7	6.8	6.5
West Phoenix, 3847 W. Earll	8.4	8.2	7.5	6.5
Phoenix Grand Ave., 27th Ave/Grand/Thomas[S]	10.3	9.6	6.6	6.1
JLG Supersite, 4530 N. 17th Ave.	7	6.5	5.7	5.2
Greenwood, I-10 and 27th Ave.	7	6.9	5.2	4.6
Maryvale, 6180 W. Encanto [S]	9	7.5	7.6	5.2
South Scottsdale, 2857 N. Miller [S]	4.5	4.4	3.2	3.1
Tempe, College Av., N. of Daily Park	4.3	4.2	3.2	3

* Due to mathematical rounding, values $\geq$ 35.5 and 9.5 ppm are necessary to exceed the standard.

[S] Seasonal monitor operating from January to March and October to December.

FIGURE 2-1
CARBON MONOXIDE MONITORING SITES IN
THE MARICOPA COUNTY NONATTAINMENT AREA

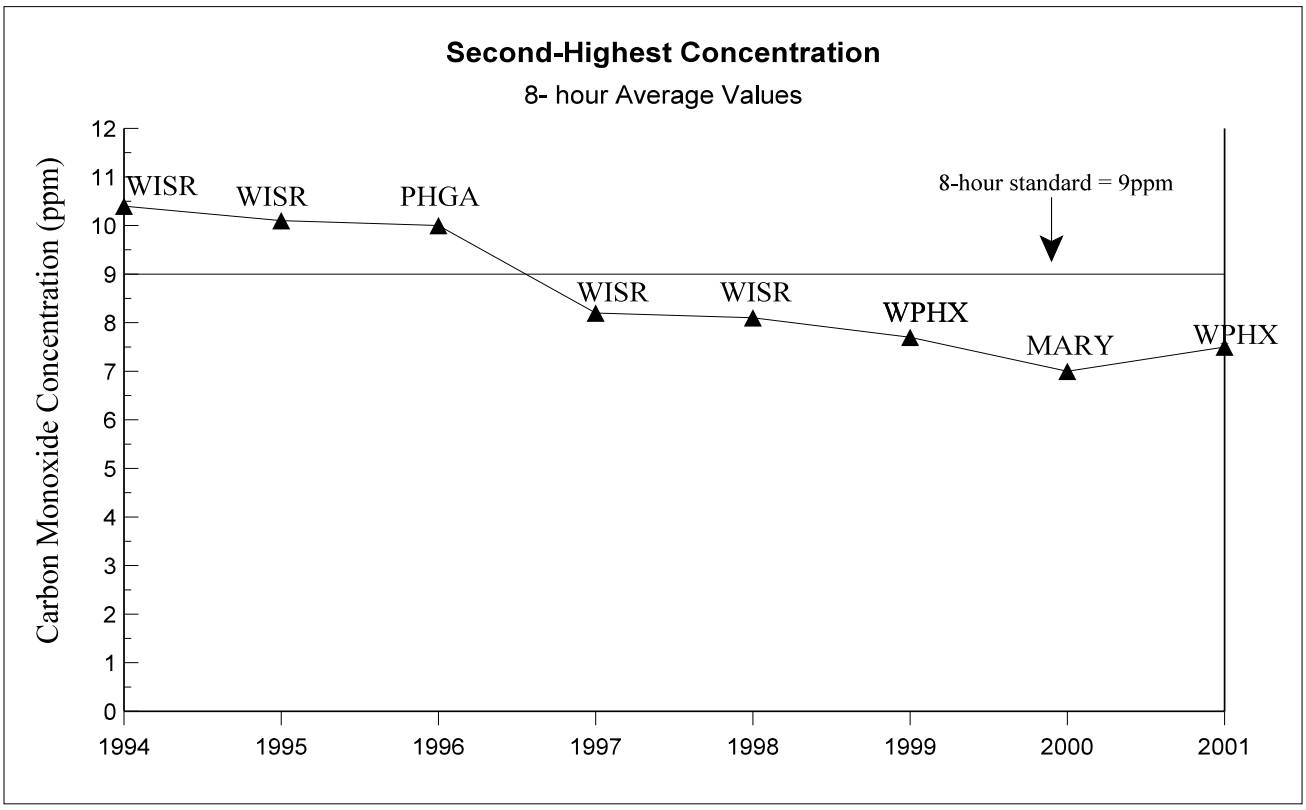


WC = West Chandler, Frye Rd & Ellis [S]
GI = Gilbert, 535 N. Lindsay Rd. [S]
GL = Glendale, 6000 W. Olive [S]
ME = Mesa, 370 S. Brooks [S]
SP = South Phoenix, 4732 S. Central [S]
CP = Central Phoenix, 1845 E. Roosevelt
NP = North Phoenix, 601 E. Butler [S]
WI = West Indian School, 3315 W. Indian School

WP = West Phoenix, 3847 W. Earll
GA = Phoenix Grand Ave., 27th Ave/ Grand/Thomas [S]
JS = JLG Supersite, 4530 N. 17th Ave.
GR = Greenwood, I-10 and 27th Ave.
MA = Maryvale, 6180 W. Encanto [S]
SS = South Scottsdale, 2857 N. Miller [S]
TE = Tempe, College Ave., N. of Daily Park

[S] = Seasonal Monitor

FIGURE 2-2
CARBON MONOXIDE TRENDS
(1994-2001)



Monitor Where Second-Highest Reading Occurred
WISR = West Indian School Road
PHGA = Phoenix Grand Avenue
WPHX = West Phoenix
MARY = Maryvale

APPROVAL OF THE CARBON MONOXIDE NONATTAINMENT SIP ELEMENT FOR THE MARICOPA COUNTY AREA

In accordance with the 1990 Clean Air Act Amendments, the Maricopa County nonattainment area was initially classified as Moderate for carbon monoxide. In order to meet the Moderate area requirements, the MAG 1993 Carbon Monoxide Plan was submitted to the Environmental Protection Agency by November 15, 1993. An Addendum to this Plan was submitted in March 1994. On July 29, 1996, the nonattainment area was reclassified to Serious due to failure to attain the carbon monoxide standard by December 31, 1995. The Serious Area reclassification was effective on August 28, 1996.

On July 8, 1999, the Arizona Department of Environmental Quality submitted the MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area to EPA. A completeness finding was issued by EPA on September 9, 1999.

Following the submission of this Plan, the Arizona Legislature passed House Bill 2104 during the 2000 regular session, which repealed the Random Onroad Testing Requirements (Remote Sensing Program) from the Vehicle Emissions Inspection Program. EPA then indicated that the Serious Area CO Plan that had been submitted, including the attainment demonstration for December 2000, would need to be revised to reflect the repeal of the Remote Sensing Program. In response, MAG conducted new air quality modeling and documented the impact of the repeal of the Remote Sensing Program in the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area, dated March 2001.

On April 18, 2001, the Arizona Department of Environmental Quality submitted the Revised MAG Serious Area Carbon Monoxide Plan to EPA. A completeness finding was issued by EPA on October 9, 2001. While this latest SIP has not been approved under Section 110(k), it is anticipated that EPA will approve the Revised CO Plan before this request for redesignation is submitted. If not, approval action on SIP elements of the Revised Serious Area Carbon Monoxide Plan and the redesignation request can occur simultaneously.

IMPROVEMENT IN AIR QUALITY DUE TO PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS

This section is intended to demonstrate that the improved air quality in the Maricopa County nonattainment area has occurred as a result of permanent and enforceable emissions reductions. The monitoring data clearly indicate that carbon monoxide concentrations have declined steadily since 1994. This continuous decline in emissions and concentrations has occurred during a period when the area has experienced more than a 25 percent increase in population, employment, and vehicle miles of travel.

According to the EPA memorandum, Procedures for Processing Requests to Redesignate Areas to Attainment, September 4, 1992, “The state must be able to reasonably attribute

the improvement in air quality to emission reductions which are permanent and enforceable." As Figure 2-2 illustrates, there has been a continuous downward trend in CO concentrations at all monitors in the nonattainment area. The second-highest CO levels decreased by 33 percent between 1994 and 2000, at the same time population, employment and vehicle travel in the nonattainment area *increased* by about 30 percent.

Modeling in the Revised Serious Area Carbon Monoxide Plan TSD (p. III-75) indicated that a 10.9 percent reduction in CO concentrations would be needed to meet the eight-hour standard in 2000. The modeling also showed that control measures in the Revised Serious Area Plan would reduce emissions by 10.4 percent in 2000 (p. 9-8) which would be sufficient to attain the standard of 9 ppm. These results indicate that there is a high correlation between reductions in CO emissions and concentrations. Since the target reductions in concentrations were actually achieved by 2000, it is reasonable to assume that the permanent and enforceable control measures in the Revised Serious Area Carbon Monoxide Plan were responsible for the reductions in emissions necessary to meet the eight-hour standard.

The Maintenance Plan described in the next chapter models the year 2015. Table VII-2 in the Carbon Monoxide Maintenance Plan Technical Support Document summarizes the emission reductions attributable to control measures in 2015. The next section describes the control measures for which numeric emission reduction credit was assumed in order to maintain the CO standards through 2015.

ATTAINMENT AND MAINTENANCE CONTROL MEASURES

Generally, the overall approach taken in preparing the Maintenance Plan is to demonstrate maintenance of the carbon monoxide standard in 2015 with the committed measures in the Revised MAG 1999 Serious Area Carbon Monoxide Plan. Therefore, the Maintenance Plan relies heavily upon the Revised MAG 1999 Serious Area Carbon Monoxide Plan and its supporting documents, including the commitments to implement control measures.

Detailed descriptions of the fifty-five control measures contained in the Revised Serious Area Carbon Monoxide Plan are contained in Chapter Eight of that Plan. The committed measures used for numeric emission reduction credit in the Carbon Monoxide Maintenance Plan for 2015 are described below. These measures, which are permanent and enforceable, are anticipated to be in place through the maintenance year of 2015. Continued implementation of these measures, as well as others in the Revised Serious Area Carbon Monoxide Plan, will ensure continuing reductions in emissions through 2015 and beyond.

1. Phased-In Emission Test Cutpoints

The Arizona Vehicle Inspection Maintenance Program was established in 1976 to promote the clean operation of motor vehicles by controlling vehicle exhaust emissions. The program is operated by the Arizona Department of Environmental Quality and contains the

provisions listed in Section 182(c)(3) of the Clean Air Act for an Enhanced Vehicle Inspection and Maintenance Program.

The Vehicle Emissions Inspection Maintenance Program was significantly enhanced and strengthened by the Arizona Legislature in 1993 (H.B. 2001). The Legislature established a biennial, transient loaded (I/M 240) emissions test for gasoline powered vehicles model year 1981 or newer with a gross vehicle weight of up to 8,500 pounds, beginning January 1, 1995.

In 1993, the Arizona Legislature passed H.B. 2001 which increased the repair threshold limits for gasoline powered vehicles in order to be eligible for a waiver through the Vehicle Emissions Inspection Maintenance Program. The repair limits were increased in the following manner: 1967-1974 from $50 to $100; 1975-1980 from $200 to $300; and 1981 and newer from $300 to $450. The bill also increased the repair threshold limits from $300 to $500 for diesel powered vehicles with tandem axles or a gross vehicle weight in excess of 26,000 pounds.

The Arizona Legislature passed H.B. 2237 in 1997 which contained an appropriation of $120,000 from the State General Fund to the Arizona Department of Environmental Quality to develop and implement an alternative test protocol to reduce the false failure rates associated with the more stringent pass-fail standards for the Vehicle Emissions Testing Program (Section 19 of H.B. 2237).

In addition, the Arizona Department of Environmental Quality was to implement Interim Test Cutpoints for the Vehicle Emissions Inspection Program until issues were resolved with the final test cutpoints for the I/M 240 Program. The Interim Cutpoints were selected to achieve the following failure rates in three vehicle class categories (Light Duty Gasoline Vehicles, Light Duty Gasoline Trucks 1, and Light Duty Gasoline Trucks 2: 50 percent for Model Years 1981-85; 25 percent for 1986 to 1989 model years, and 10 percent for Model Years 1990-93). This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure is estimated to provide a 2.7 percent reduction in emissions in the year 2000 and a 0.2 percent reduction, in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-5 and the Carbon Monoxide Maintenance Plan TSD on page VII-10.

2. One-Time Waiver from Vehicle Emissions Test

The Arizona Legislature passed S.B. 1002 in 1996 which limits the issuance of a waiver for failure to comply with the emission testing requirements to one-time only beginning January 1, 1997 (A.R.S. 49-542 D). This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure is estimated to provide a 0.3 percent reduction in emissions in the year 2000, and a 0.1 percent reduction, in 2015. Additional information

on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-10 and the CO Maintenance Plan Technical Support Document on page VII-11.

3. Winter Fuel Reformulation: California Phase 2 Reformulated Gasoline with 3.5 Percent Oxygen Content November 1 through March 31

The Arizona Legislature passed H.B. 2347 in 1998 which contains requirements for all gasoline produced and shipped to Maricopa County and sold or offered for sale for use in motor vehicles in Area A from and after November 1, 2000 through March 31, 2001 and from the period beginning November 1 through March 31 of each subsequent year. The fuel must comply with the standards for California Phase 2 Reformulated Gasoline, including alternative reformulations allowed by the predictive model, as adopted by the California Air Resources Board, and must meet the maximum vapor pressure requirements of 9 pounds per square inch in A.R.S. 41-2083, Subsections D and F. The fuel must also contain a minimum oxygen content by weight of 3.5 percent as required in A.R.S. 41-2123, Subsection A, Paragraph 2.

This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure accounts for a 6.8 percent reduction in emissions in the year 2000, and a 21.5 percent reduction, in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-17 and the Carbon Monoxide Maintenance Plan Technical Support Document on page VII-8.

4. Coordinate Traffic Signal Systems

The Arizona Legislature passed H.B. 2001 in 1993 which required that Maricopa County and the cities and towns in the vehicle emissions control area (Maricopa County nonattainment area) synchronize traffic control signals on all roadways, within and across jurisdictional boundaries, which have a traffic flow exceeding 15,000 motor vehicles per day.

The synchronization of existing signals, as well as the enhancement of coordination among signal systems that are already synchronized, has been identified by many jurisdictions through a number of programs. Enhancement efforts range from large scale programs covering broad geographic areas to incremental additions of a few synchronized signals to the network. This includes both individual city projects and regional programs, such as AZTech, also mentioned below.

This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure is estimated to provide a 0.6 percent reduction in emissions in the year 2000 and a 0.2 percent reduction, in 2015. Additional information on this measure can be found in the Revised Serious Area CO Plan on page 8-88 and the CO Maintenance Plan TSD on page VII-13.

5. Develop Intelligent Transportation Systems

Many local jurisdictions have begun planning and implementing advanced technology based solutions to address complex traffic management issues on the regional transportation network. These technologies involve the application of electronics, telecommunications and sensor technologies and are collectively referred to as Intelligent Transportation Systems (ITS).

A key component of the regional Intelligent Transportation Infrastructure is the Freeway Management System (FMS) operated by the Arizona Department of Transportation (ADOT). The FMS currently covers 42 miles of the freeway system and provides services such as traveler advisories and incident management. The other major regional ITS initiative is the AZTech project. This project was selected and funded by USDOT to serve as one of four ITS Model Deployment Initiatives in the nation. Key elements of the AZTech project are the interconnection of 13 local traffic management centers and the instrumentation of eight “smart” corridors that cover nearly 150 miles of arterial streets.

This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure accounts for a 0.4 percent reduction in emissions in the year 2000 and a 0.1 percent reduction, in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-31 and the Carbon Monoxide Maintenance Plan TSD on page VII-14.

6. Defer Emissions Associated with Government Activities

A number of jurisdictions have identified their intent to pursue methods for deferring emissions out of critical air pollution periods. These activities include restructuring use of two-cycle gasoline-powered lawn and garden maintenance equipment after 2:00 p.m., placing requirements on maintenance contractors, and encouraging employees to limit vehicle idling and other activities which may contribute to air pollution during critical periods.

This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and a committed maintenance measure in the Maintenance Plan. This measure does not result in a reduction in daily emissions of CO in 2000 and 2015, but rather, shifts the emissions-producing activity to earlier in the day (6 a.m. to 2 p.m.). This reduces the contribution of emissions to eight-hour carbon monoxide concentrations during winter inversion conditions. Additional information on this measure can be found in the Revised Serious Area CO Plan on page 8-47 and the Carbon Monoxide Maintenance Plan Technical Support Document on page VII-12.

7. Tougher Enforcement of Vehicle Registration and Emissions Test Compliance

The Motor Vehicle Division (MVD) of the Arizona Department of Transportation (ADOT) has instituted a comprehensive vehicle registration enforcement program. Three key elements of the new program are a Registration Enforcement Team, a Registration Enforcement Tracking System, and a New Resident Tracking Program. Through public participation, consistent policy and procedure application, and new tracking methods, MVD will enforce the Arizona registration laws to ensure vehicles in question are registered properly. This will be an ongoing effort.

Another phase of the Program is an initiative to coordinate ADOT efforts with other law enforcement agencies to assist MVD personnel in enforcing registration compliance. Other initiatives include a system user agreement between MVD and the City Courts to utilize information in conjunction with registration compliance and discussions with U.S. West (now known as Qwest) for obtaining information relating to new connect customers.

The Arizona Legislature passed S.B. 1427 in 1998 which requires school districts and special districts in Area A to prohibit parking in employee parking lots by employees who have not complied with emissions testing requirements. Cities, towns, and counties in Area A and Area B are currently subject to this provision (A.R.S. 49-552).

In 1999, the Arizona Legislature passed H.B. 2254 which requires each vehicle that is owned by the United States government and that is domiciled in this state for more than ninety consecutive days and each vehicle that is owned by a state or political subdivision of this state to comply with A.R.S. 49-542.

Collectively, the provisions in H.B. 2254 that apply to Tougher Enforcement of Vehicle Registration and Emissions Test Compliance include A.R.S. 49-557 and 49-541.01 D. and E.

This measure is a committed contingency measure in the Revised Serious Area Carbon Monoxide Plan and is estimated to reduce emissions by 0.4 percent in the year 2000. This measure is a committed maintenance measure in the Maintenance Plan and accounts for a 0.2 percent reduction in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-13 and the Carbon Monoxide Maintenance Plan Technical Support Document on page VII-15.

8. Clean Burning Fireplace Ordinances

The Arizona Legislature passed S.B. 1427 in 1998 which requires cities, towns, and counties in Area A to adopt, implement and enforce an ordinance that complies with the clean burning fireplace standards adopted by the Metropolitan Planning Organization that is responsible for air quality planning in Area A by December 31, 1998. The ordinance must prohibit the installation or construction of a fireplace or wood stove unless it is one of the following:

1. A fireplace that has a permanently installed gas or electric log insert.

2. A fireplace, a wood stove or any other solid fuel burning appliance that is any of the following:

   (a) Certified by the U.S. Environmental Protection Agency as in compliance with 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

   (b) A wood stove tested and listed by a nationally recognized testing agency to meet performance standards equivalent to those in 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

   (c) Determined by the County Air Quality Control Officer to meet performance standards equivalent to those in 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

3. A fireplace that has a permanently installed wood stove insert that complies with paragraph 2, subdivision (a), (b) or (c) of this section.

The ordinance is required to prohibit the subsequent conversion or alteration of a permitted fireplace or wood stove to a nonpermitted use. The ordinance may provide for exemptions from regulation for heating or industrial equipment, cooking devices and outdoor fireplaces. The state income tax subtraction of $500 dollars for the purchase and installation of a qualified wood stove, wood fireplace or gas fired fireplace and non-optional equipment is removed. The subtraction of $500 dollars for the conversion of an existing wood fireplace to a qualified fireplace is retained.

A county that contains any portion of Area A that has a population of less than 1,200,000 according to the most recent U.S. decennial census shall adopt, implement, and enforce the ordinance only in those portions of the county which are located in Area A (A.R.S. 9-500.16 and 11-875).

This measure is a committed contingency measure in the Revised Serious Area Carbon Monoxide Plan and is estimated to reduce emissions by 0.1 percent in the year 2000. This measure is a committed maintenance measure in the Maintenance Plan and accounts for a 0.3 percent reduction in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-53 and the Carbon Monoxide Maintenance Plan Technical Support Document on page VII-17.

9. Off-Road Vehicle and Engine Standards

The Arizona Legislature passed H.B. 2237 in 1997 which requires the Arizona Department of Environmental Quality to adopt rules for air pollution emission standards for off-road

vehicles and engines marketed in the State beginning with the 1999 model year. The standards may include the following categories:

a. Heavy duty Diesel vehicles rated at 175-750 horsepower.
b. Small utility and lawn and garden equipment engines rated at less than 25 horsepower.
c. Recreational vehicles rated at less than 25 horsepower.
d. Specialty engines and go-carts rated at greater than 25 horsepower.
e. Off-road motorcycles and all terrain vehicles.

The Arizona Department of Environmental Quality is also required to adopt air pollution emission standards for golf cart engines in Maricopa County (A.R.S. 49-542.04).

Since the adoption of H.B. 2237, federal standards for the same class and types of off-road engines and equipment became effective that are either equivalent to or more stringent than California's standards. Consequently, the Arizona Department of Environmental Quality submitted a letter to EPA on September 7, 2001 to inform EPA of ADEQ's intent to withdraw from adopting California's standards for off-road vehicles and engines marketed in the state, beginning with the 1999 model year. Therefore, the federal off-road standards are being implemented in this state.

This measure is a committed attainment measure in the Revised Serious Area Carbon Monoxide Plan and is estimated to reduce emissions by 0.4 percent in the year 2000. However, no numeric credit was assumed for this measure in the Revised Serious Area Carbon Monoxide Plan, because the standards had not been adopted at the time the Plan was submitted. This measure is a committed measure in the maintenance plan and accounts for a 1.9 percent reduction in 2015. Additional information on this measure can be found in the Revised Serious Area Carbon Monoxide Plan on page 8-42 and the Carbon Monoxide Maintenance Plan Technical Support Document on page VII-19.

CLEAN AIR ACT SECTION 110 AND PART D REQUIREMENTS

Before an area can be redesignated to attainment, it must meet the requirements of Section 110 and Part D of the Clean Air Act. The provisions of Section 110(a)(2) and Part D are required as part of the State Implementation Plan to bring the Maricopa County nonattainment area into attainment, and have been addressed in plan submissions currently under review by EPA. EPA has indicated that they expect to approve the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area in 2003. Upon approval of this Plan, EPA will have determined that all applicable provisions of Section 110 and Part D have been met. The following section lists the applicable requirements of Section 110 and Part D and provides references from the Revised Serious Area Carbon Monoxide Plan that address those requirements.

Section 110(a)(2) addresses general requirements for State Implementation Plans. A discussion of how each of these requirements is addressed in the Revised Serious Area

Carbon Monoxide Plan follows. The numbers in parentheses indicate the subsection of the following narrative in which each of the Section 110(a)(2) requirements is addressed below.

(A) Include enforceable measures and schedules necessary to show compliance. (1)
(B) Monitor and compile data on ambient air quality. (2)
(C) Provide a program to enforce measures in (A) and regulate stationary sources. (1),(4)
(D) Prohibit sources from emitting pollutants that would contribute significantly to nonattainment, interfere with maintenance of the standard, or interfere with Prevention of Significant Deterioration (PSD) or visibility in other states. (3)
(E) Provide assurances that there are adequate resources to implement the plan, nothing in the SIP is otherwise prohibited by law, and the State has responsibility for ensuring adequate implementation. (1)
(F) Stationary source emissions monitoring and reporting. (4)
(G) Provide for emergency powers authority. (5)
(H) Provide for the revisions to the plan. (6)
(I) Meet the applicable requirements of Part D for nonattainment areas. (10)
(J) Meet the requirements of Section 121 (consultation). (9);Section 127 (public notification);(7) and part C (PSD and visibility). (3),(4)
(K) Perform air quality modeling. (8)
(L) Permitting fees for major stationary sources. (4)
(M) Consultation and participation by local political subdivisions affected by the SIP. (9)

(1) Enforcement, Adequate Resources, and Responsibility for Adequate Implementation

Sections 110(a)(2)(A), (C) and (E) concerning plan enforcement and implementation requirements are addressed in Chapter Eight (page 8-146) and Chapter Eleven (page 11-1) of the Revised Serious Area Carbon Monoxide Plan. In order to comply with these sections, a State law was passed in 1992 which provides an approach for assurances that State and local committed measures will be adequately implemented (A.R.S. Section 49-406 I. and J).

Regarding committed measures, A.R.S. Section 49-406 G. (passed by the Legislature in 1992) requires that each agency which commits to implement any control measure contained in the State Implementation Plan must describe the commitment in a resolution. The resolution must be adopted by the appropriate governing body of the agency. State law also requires the entity to specify the following information in the resolutions: (1) its authority for implementing the limitation or measure as provided in statute, ordinance, or rule; (2) a program for the enforcement of the limitation or measure; and (3) the level of personnel and funding allocated to the implementation of the measure.

Chapter Eleven of the Revised Serious Area Carbon Monoxide Plan includes resolutions from the MAG member agencies and other implementing entities. The resolutions indicate

specific commitments to implement various control strategies. Generally, the authorities of cities and towns to implement the types of measures that they have committed to in their respective resolutions are provided under A.R.S. § 9-240 Powers of Common Council. The general authorities of the County to implement the measures in the commitments are provided under A.R.S. § 11-251 and A.R.S. § 49-478. Copies of these local and county government authorities are included in Chapter Eleven of the Revised Serious Area Carbon Monoxide Plan.

If any person (includes State, County, local governments, regional agencies, and other entities) fails to implement a committed measure, the County would file an action in Superior Court to have the Court order that the measure be implemented. Likewise, the Director of the Arizona Department of Environmental Quality will backstop the County if it fails to implement a committed measure or if the County fails to backstop the local governments and regional agencies (see Appendix C, Exhibit 2, Revised Serious Area Carbon Monoxide Plan).

(2) Monitoring and Compiling of Data on Ambient Air Quality

Section 110(a)(2)(B) establishes the requirement to monitor, compile, and analyze ambient air quality data. Appendix A, Exhibit 2 of the Revised 1999 Plan contains the 1992 Memorandum of Agreement for Air Quality Planning. This agreement identifies Maricopa County and the Arizona Department of Environmental Quality as having the primary roles for air quality monitoring, including special purpose air quality and meteorological monitoring for plan development.

Chapter Four of the Revised Serious Area Carbon Monoxide Plan (page 4-5) provides additional evidence that the monitoring requirements for the region are being met through the efforts of the Maricopa County Environmental Services Department and the Arizona Department of Environmental Quality. Arizona Statutes 49-406. Nonattainment area plan and 49-424. Duties of Department provide the regulatory basis for air quality monitoring in the State and any nonattainment areas. Additional information on the current ambient air quality monitoring network operated in the Maricopa nonattainment area is detailed earlier in this chapter.

(3) Provisions to Prohibit Sources from Impacting Air Quality in Other States

Section 110(a)(2)(D) requires that a SIP contain adequate provisions prohibiting any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard; or interfere with measures required to be included in the applicable implementation plan for any other State under Part C to prevent significant deterioration of air quality or to protect visibility.

Visibility, as defined in Part C of the Clean Air Act, is currently addressed through a Federal Implementation Plan for the State of Arizona. The transient nature of carbon monoxide emissions and the lack of proximity to another state make it unlikely that carbon monoxide emissions are transported from the nonattainment area to another state.

(4) Preconstruction Review for All New and Modified Stationary Sources; Stationary Source Emissions Monitoring; and Permitting Fees for Major Stationary Sources

The requirements of Sections 110(a)(2)(C), (F), and (L) concerning preconstruction review, emissions monitoring, and permitting fees for stationary sources are addressed by the State in Title 49. Article 2. State Air Pollution Control, and Article 3. County Air Pollution Control, of the Arizona Revised Statutes. Compliance with this requirement is the responsibility of the Arizona Department of Environmental Quality or applicable county agency. Appendix A, Exhibit 2 of the Revised Plan contains the 1992 Memorandum of Agreement for Air Quality Planning. This agreement identifies Maricopa County as having the lead role for stationary source emissions control.

Following adoption by the State, Maricopa County adopted new source review regulations designed to prevent significant deterioration of air quality, patterned after the State regulations. The Maricopa County Regulations contain requirements for obtaining installation permits for new major sources located in nonattainment, attainment, or unclassifiable areas. Both the State and Maricopa County new source review regulations are currently in effect.

The Maricopa County Air Pollution Control Regulations contain the regulations that constitute the legal basis for control of air pollution sources in Maricopa County, Arizona. They are adopted to implement the policy set forth in Title 49 of the Arizona Revised Statutes and to fulfill the State's responsibilities under the Federal Clean Air Act and its amendments to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards.

Applicable Maricopa County Air Pollution Control Regulations include; Rule 240 - Permits for New Major Sources and Major Modifications to Existing Major Sources, Rule 241 - Permits for New Sources and Modifications to Existing Major Sources, and Rule 245 - Continuous Source Emission Monitoring.

(5) Provide for Authority Comparable to that in Section 303 for Emergency Powers

Section 110(a)(2)(G) addresses the authority for emergency powers. Under Section 303 of the Clean Air Act, upon receipt of evidence that a pollution source or combination of sources (including moving sources) is presenting an imminent and substantial endangerment to public health or welfare, or the environment, the EPA Administrator may bring suit on behalf of the United States in the appropriate United States district court to immediately restrain any person causing or contributing to the alleged pollution to stop the emission of air pollutants causing or contributing to such pollution or to take such other

action as may be necessary. If it is not practicable to assure prompt protection of public health or welfare or the environment by commencement of such a civil action, the Administrator may issue such orders as may be necessary to protect public health or welfare or the environment.

Emergency powers for the State of Arizona are addressed under A.R.S. 49-465. Imminent and substantial endangerment, 49-462.07 Violation; injunctive relief, and 49-465 Air Pollution Emergency.

(6) Provide for Plan Revisions to Account for Changes to the NAAQS or When a Plan is Found Substantially Inadequate to Attain a Standard

Section 110(a)(2)(H) requires a plan revision to take account of revisions of such national primary or secondary ambient air quality standard, or the availability of improved or more expeditious methods of attaining such standard, and whenever the Administrator finds that the plan is substantially inadequate to attain the national ambient air quality standard.

A.R.S. 49-404 State Implementation Plan and 49-406 Nonattainment Area Plan provisions provide for State, county, and local agencies to revise the SIP to account for changes to air quality standards or if a plan is found to be inadequate. The applicable documentation for making plan revisions can be found in Appendix A, Exhibit 2, 1992 Memorandum of Agreement for Air Quality Planning.

(7) Meet the Applicable Requirements of Section 127 (Relating to Public Notification)

Section 110(a)(2)(J) requires a plan revision to meet the applicable requirements of Section 127 relating to Public Notification. Public notification procedures followed for the Revised Serious Area Carbon Monoxide Plan are documented in the section, Public Participation in the Preparation of the MAG 1999 Serious Area Carbon Monoxide Plan and MAG 1999 Serious Area PM-10 Plan, in Chapter Ten (page 10-3).

(8) Air Quality Modeling

Section 110(a)(2)(K) provides for the performance of such air quality modeling as the Administrator may prescribe for the purpose of predicting the effect on ambient air quality of any emissions of any air pollutant for which the Administrator has established a national ambient air quality standard, and the submission, upon request, of data related to such air quality modeling to the Administrator.

Chapter Nine, Demonstration of Attainment Status (page 9-1) and Appendix B, Exhibit 4 - Revised Technical Support Document for Carbon Monoxide Modeling in Support of the Revised 1999 Serious Area Carbon Monoxide Plan for Maricopa County, Arizona, document the air quality modeling conducted in support of the local air quality plans. Chapter Nine includes several of the key elements of the carbon monoxide modeling

process, including an assessment of future air quality conditions, a summary of committed control measure impacts, and projected attainment status.

(9) Consultation and Participation by Local Political Subdivisions Affected by the SIP

Evidence for consultation and participation by local political subdivisions affected by the SIP can be found in Chapter Ten, Public Participation (page 10-1). The decision-making structure of the Maricopa Association of Governments includes twenty-five cities and towns, the Salt River Pima-Maricopa and Gila River Indian Communities, Maricopa County and the Arizona Department of Transportation.

Appendix A, Exhibit 2 -1992 Memorandum of Agreement for Air Quality Planning from the Revised MAG 1999 Serious Area Carbon Monoxide Plan, and Chapter One of this document detail the consultation and participation process for development of the local air quality plans.

(10) Meet the Applicable Requirements of Part D

The requirement for Nonattainment Plan Provisions are established in Part D, Subpart 1, Section 172(c), and in Subpart 3, Section 187. Section 172 lists general nonattainment plan provisions, and Section 187 lists additional provisions for carbon monoxide nonattainment areas. In those instances where an area is subject to both the general nonattainment provisions in subpart 1 as well as one of the pollutant-specific subparts, the general provisions may be subsumed within, or superseded by, the more specific requirements of Subpart 3.

Subpart 1, Section 172(c), Nonattainment Plan Provisions

1. Implement all reasonably available control measures as expeditiously as practicable

The fifty-five control measures in Chapter Eight of the Revised Serious Area Carbon Monoxide Plan (page 8-5) have been implemented. Many of these measures go well beyond reasonably available control measures. The effective implementation of the measures in the adopted plan was an important element in achieving attainment before the required date of December 31, 2000. Effective and expeditious implementation of the control measures resulted in meeting the standard before the attainment date and will also assist in the continued maintenance of that standard.

In addition, the Maricopa County Environmental Services Department reviews the implementation status of the various measures contained in the air quality plans on an annual basis. In order to accurately monitor or track plan implementation, the Maricopa County Environmental Services Department requests that the implementing agencies and jurisdictions complete an annual progress report form. The Environmental Services Department reviews and summarizes this information, preparing an implementation status report, and then presents the report to the MAG Air Quality Technical Advisory Committee.

The most recent progress report at the time of the Revised 1999 Serious Area Carbon Monoxide Plan was the MAG Air Quality Plan 1996 Annual Progress Report (July 1998) that was provided in Appendix B, Exhibit 2 (see also Chapter 8 Tracking Plan Implementation, page 8-146).

2. Plans shall require reasonable further progress

In Part D of the Clean Air Act, Section 171 indicates that the term "Reasonable Further Progress" means such "annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonable be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." The modeling results presented in Chapter Nine of the Revised Serious Area Carbon Monoxide Plan supported the conclusion that the Maricopa County Nonattainment Area would achieve reasonable further progress in meeting the CO standard by the applicable attainment date, December 31, 2000 (Chapter Nine, Reasonable Further Progress, page 9-15). Since the attainment date of 2000 has passed and attainment and reasonable progress targets have been met, annual incremental reductions are not longer required.

However, in order to track the progress of the maintenance plan, periodic emission inventories will be prepared every three years in accordance with Section 187(a)(5) of the Clean Air Act. Maricopa County will coordinate and compile the inventory with input and assistance from the Arizona Department of Environmental Quality, Arizona Department of Transportation, and Maricopa Association of Governments, as described in the 1992 Air Quality Memorandum of Agreement. Changes in the inventory will be reviewed and evaluated through the regional air quality planning process to determine if additional measures should be considered.

3. Plans shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in the area and periodic revisions

The Clean Air Act requires a comprehensive, accurate, and current inventory of actual emissions from all sources. In 1996, the Maricopa County Environmental Services Department compiled a 1993 base year emission inventory to determine the sources of carbon monoxide (CO) for the nonattainment area. During October - November, 1998, Maricopa County completed a draft 1996 carbon monoxide emissions inventory. Both the 1993 and 1996 inventories are summarized in Chapter Four - Sources of Carbon Monoxide Emissions, and Figures 4-1 and 4-2, respectively, of the Revised Serious Area Carbon Monoxide Plan.

The sources of emissions are grouped into four major categories: onroad mobile, nonroad mobile, stationary area, and stationary point. Collectively, these four sources contributed a total of 871.5 tons and 1030 tons of CO per day to the nonattainment area during the 1993 and 1996 winter seasons, respectively. Figures 4-1 and 4-2 of the Revised Serious

Area Carbon Monoxide Plan show the relative contribution of each category for 1993 and 1996. A complete description of these sources and the corresponding methodology used to calculate Carbon Monoxide emissions for the 1993 base year are included in the Maricopa County 1993 Periodic Carbon Monoxide Emission Inventory, September 5, 1996 (Appendix A, Exhibit 4 of the Revised Serious Area CO Plan). The Maricopa County 1996 Base Year Carbon Monoxide Emission Inventory, December 16, 1998 is contained in Appendix A, Exhibit 5 of the Revised Serious Area CO Plan.

In addition to the 1993 and 1996 periodic emissions inventories, the Revised Serious Area Carbon Monoxide Plan contains emissions used for modeling the episode days of December 16-17 of 1994 and the attainment year of 2000. The 1994 and 2000 base case emissions are summarized in Table II-4 of the Revised Serious Area Carbon Monoxide Plan TSD and the 2000 committed measure package emissions are shown in Table VI-1 of that same document. After the Revised Serious Area Carbon Monoxide Plan was submitted to EPA, a 1999 periodic CO emissions inventory was prepared by the Maricopa County Environmental Services Department with input from the Arizona Department of Environmental Quality, Arizona Department of Transportation, and Maricopa Association of Governments. The 1999 periodic CO emissions inventory was submitted to EPA in August 2002.

4. The plan provisions shall identify and quantify the emissions of any pollutant allowed from the construction and operation of major new or modified stationary sources in the area

Chapter Four of the Revised Serious Area Carbon Monoxide Plan gives details on stationary sources emissions, including major new or modified sources. Chapter Nine documents the impacts from major stationary sources. The 1992 Memorandum of Agreement for Air Quality Planning found in APPENDIX A, Exhibit 2, provides the distribution of responsibilities for local air quality planning. The Maricopa County Environmental Services Department regulates stationary sources in Maricopa County through the Maricopa County Air Pollution Control Regulations, including Regulation II - Permit and Fees, and Rule 240 - Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources.

Section 172(c)(4) requires an area, in developing its plan for attainment, to identify expected emissions increases that will result from new or modified major sources in a "zone to which economic development should be targeted" according to Section 173(a)(1)(B). These provisions effectively allow the State to provide a "growth allowance" for sources in such an area in lieu of the offset requirements under Section 173(a)(1)(A). Since this is an optional alternative to requiring the acquisition of offsets under Section 173(a)(1)(A), it is not a prerequisite to redesignation. Moreover, once the area is redesignated attainment, these provisions will not apply since the Prevention of Significant Deterioration (PSD) requirements of Part C will become effective.

5. The plan provisions shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area

Generally, the requirements of the Part D New Source Review (NSR) permitting nonattainment program will be replaced by the Prevention of Significant Deterioration (PSD) program once an area is redesignated to attainment. However, to ensure that the PSD program can become fully effective immediately upon redesignation, EPA will require an area to make any needed NSR corrections to their Part C NSR programs prior to redesignation.

Maricopa County received SIP approval of its major and minor source NSR program in 1988 (See 53 FR 30220, 53 FR30224, and 53 FR 30238, August 10, 1988). Effective November 22, 1993, EPA delegated Prevention of Significant Deterioration (PSD) authority to Maricopa County via a PSD Delegation Agreement. On August 15, 1994, ADEQ submitted a SIP revision containing portions of the State permitting program that are applicable to major sources, major source modifications, and minor sources. Part of the SIP revision, under a separate cover, included applicable Maricopa County rules, pertinent to the NSR/PSD program. The amendments to Maricopa County Rules 100, 200, 210, 220, 240, and Appendix B were submitted as a revision to the NSR/PSD program. The submittal also requested approval of synthetic minor provisions under Section 112 (l) of the CAA. On September 1, 1994, EPA deemed both the ADEQ and Maricopa County SIP revision complete and each is currently awaiting full approval. To assure adequate SIP revisions required by Section 110(a)(2)(E) of the CAA, the Director of ADEQ is authorized under ARS §§ 49-402B to assert jurisdiction over major NSR/PSD and minor NSR sources, excluding those located on Indian Reservations. ADEQ received SIP approval of its NSR/PSD program effective May 3, 1983 and delegation of PSD authority for PM-10 effective March 12, 1999.

The EPA guidance memorandum, Part D New Source Review (Part D NSR) Requirements for Areas Requesting Redesignation to Attainment, October 14, 1994, states that “nonattainment areas may be redesignated to attainment notwithstanding the lack of a fully-approved part D NSR program, provided the program is not relied upon for maintenance.” In addition, the EPA guidance indicates that part D NSR rules do not need to be placed in the contingency portion of the maintenance plan. It is important to note that the Carbon Monoxide Maintenance Plan for the Maricopa County nonattainment area does not rely on credit for the NSR program to demonstrate maintenance.

6. Include enforceable emission limitations and other control measures, means, or techniques, as well as schedules and timetable for compliance to provide for attainment of such standard

Since attainment has been achieved, no additional measures are needed to provide for attainment. The need for additional measures to ensure that maintenance continues is addressed under the requirements for maintenance plans. Areas should consider the need

for offsets under the Part C program to ensure that new sources do not "cause or contribute" to an increase in pollutant levels that would take the area out of compliance.

7. Plans shall meet the applicable requirements of Section 110(a)(2)

In the requests for SIP redesignation, States must show that their plans satisfy the requirements under Section 110. These requirements specify that the plans must contain enforceable emission limits, monitoring requirements, procedures to prevent interstate pollution problems, adequate resources to carry out the control programs, and other provisions related to the development and administration of effective air pollution control programs.

The Arizona Revised Statutes Title 49-401 through 470 contain the requirements for the State Air Pollution Control Program administered by the Arizona Department of Environmental Quality. Also, the Arizona Revised Statutes Title 49-471 through 516 contain the requirements for the County Air Pollution Control Program. The Maricopa County Environmental Services Department is the local air pollution control department for Maricopa County. In addition, the State and local government commitments to implement specific air quality measures address the actual implementation and resources necessary for a wide variety of measures. The Commitments documents which accompany the Revised MAG 1999 Serious Area Carbon Monoxide Plan include the State legislation and local government commitments for measure implementation.

The Arizona SIP already includes the provisions required by Section 110(a)(2) and Part D of the Clean Air Act. In approving the Revised MAG 1999 Serious Area Carbon Monoxide Plan, EPA will be determining that the State has met the requirements of Section 110(a)(2) and Part D of the Clean Air Act.

8. States may use equivalent techniques for modeling, emission inventories, planning procedures unless they are less effective than the methods specified by the Administrator

The provisions of Section 172(c)(8) allow the State to use equivalent techniques for modeling, inventorying, or other planning activities unless EPA determines that the techniques are less effective. This allowance will continue to apply with respect to the requirements of the maintenance plan.

9. Provide for specific contingency measures to be undertaken if the area fails to make reasonable further progress, or to attain the NAAQS by the applicable attainment date

The Clean Air Act requires contingency measures to be implemented in three cases: (1) if the area fails to make reasonable further progress or to attain the National Ambient Air Quality Standard by the applicable attainment date, (2) if the area fails to meet an applicable milestone, or (3) if any estimate of vehicle miles traveled (VMT) or updated

projections of future VMT submitted in an annual report exceeds the VMT predicted in the most recent prior forecast, taking into account reasonable margins of predictive error (see Chapter Three of the Revised Serious Area CO Plan). Based on EPA guidance, committed, implemented measures may be considered contingency measures if they are not needed to show attainment and do not hasten attainment.

EPA guidance does not mandate a specific reduction level to be attained by contingency measures. However, EPA considers measures that offset one year of VMT growth to be an appropriate guideline for the impact of contingency measures. For the Maricopa County Carbon Monoxide nonattainment area, annualized VMT growth from 2000 to 2005 is 2.6 percent. Based on the 2000 base case emissions inventory, onroad mobile emissions account for 67 percent of the carbon monoxide emissions in the nonattainment area. Therefore, contingency measures that provide approximately a 1.7 percent reduction in total carbon monoxide emissions should be adopted to meet the EPA guidelines regarding contingency measure impacts.

The impact of each contingency measure has been estimated individually (see Section V of the Revised TSD). The results of these analyses are shown in Figure 9-3 of the Revised Serious Area Carbon Monoxide Plan. The sum of the impacts attributed to the contingency measures is approximately 1.7 percent. However, due to possible interactions between contingency measures, the combined effect of simultaneously implementing all of the contingency measures may not equal the sum of the individual effects. The diverse nature of the contingency measures helps ensure that each of the larger source categories (i.e., area, nonroad mobile, and onroad mobile) are addressed (Chapter 9 CONTINGENCY MEASURES, Revised Serious Area Carbon Monoxide Plan).

The Section 172(c)(9) requirements for contingency measures are directed at ensuring reasonable further progress and attainment by the applicable date. These requirements no longer apply when an area has attained the standard and is eligible for redesignation. Furthermore, Section 175(A) for maintenance plans (discussed above) provides specific requirements for contingency measures that effectively supersede the requirements of Section 172(c)(9) for these areas.

Subpart 3, Section 187(b), Plan Submissions and Requirements, Serious Area Requirements

1. Meet requirements for Moderate areas with a design value of 12.7 or greater

    a. Emissions Inventory

The State is required to submit a comprehensive, current, and current emission inventory of all sources as described in Section 172(c)(3). This requirement was addressed earlier in paragraph 3 of the requirements for Subpart 1, Section 172(c), Nonattainment Plan Provisions.

b. Vehicle Miles Traveled

Section 187(a) of the Clean Air Act Amendments of 1990 requires that states containing a carbon monoxide nonattainment area with a design value greater than 12.7 ppm at the time of classification must forecast vehicle miles traveled (VMT) in the nonattainment area for each year before the attainment year. EPA has prepared guidance, dated January 1992, regarding compliance with this requirement. For Moderate areas reclassified as Serious, such as the Maricopa County area, EPA is to issue new SIP guidance pertaining to implementation of the Section 187 forecasting and tracking provisions at the time of reclassification.

Upon reclassification of the Maricopa County nonattainment area to Serious, MAG consulted with EPA and was advised to apply the January 1992 guidance in preparing the Serious Area CO Plan. Accordingly, the VMT estimation procedures used in the Plan are consistent with Section 187 guidance for Serious Carbon Monoxide nonattainment areas. Details of the forecasts and procedures are presented in Chapter Three, Vehicle Miles of Travel Forecasting and Tracking, in the Revised Serious Area Carbon Monoxide Plan.

According to EPA Section 187 guidance, VMT tracking reports must be submitted to EPA beginning in the year the Serious Area Carbon Monoxide Plan is submitted (i.e., 1999), continuing through the year after attainment (i.e., 2001). MAG made a commitment in the Revised Serious Area Carbon Monoxide Plan to submit annual VMT tracking reports to EPA after providing for consultation among all affected agencies.

MAG submitted VMT tracking reports to EPA in 1999, 2000 and 2001. The contents of these annual reports complied with all requirements of Section 187 guidance. The final report required under this provision, the MAG, 2001 Vehicle Miles of Travel Forecasting and Tracking Report ,was submitted to EPA in November 2001.

c. Vehicle Inspection & Maintenance Program

The State Vehicle Inspection Maintenance Program established in 1976 is designed to promote the clean operation of motor vehicles by controlling vehicle exhaust emissions. The program is operated by the Arizona Department of Environmental Quality and contains the provisions listed in Section 182(a)(2)(B) of the Clean Air Act for a Vehicle Inspection and Maintenance (I/M) Program.

The Vehicle Emissions Inspection Maintenance Program was significantly enhanced and strengthened by the Arizona Legislature in 1993 (H.B. 2001). The Legislature established a biennial, transient loaded (I/M 240) emissions test for gasoline powered vehicles model year 1981 or newer with a gross vehicle weight of up to 8,500 pounds, beginning January 1, 1995.

H.B. 2001 also increased the repair threshold limits for gasoline powered vehicles in order to be eligible for a waiver through the Vehicle Emissions Inspection Maintenance Program. The repair limits were increased in the following manner: 1967-1974 from $50 to $100; 1975-1980 from $200 to $300; and 1981 and newer from $300 to $450. The bill also increased the repair threshold limits from $300 to $500 for diesel powered vehicles with tandem axles or a gross vehicle weight in excess of 26,000 pounds.

The Arizona Legislature passed S.B. 1002 in 1996 which limits the issuance of a waiver for failure to comply with the emission testing requirements to one-time only beginning January 1, 1997 (A.R.S. 49-542 D.). This measure is documented in the Revised Serious Area CO Plan as "One-Time Waiver from Vehicle Emissions Test," on page 8-10; and in the Technical Support Document, beginning on page V-14.

The Arizona Legislature passed H.B. 2237 in 1997 which contains an appropriation of $120,000 from the State General Fund to the Arizona Department of Environmental Quality to develop and implement an alternative test protocol to reduce the false failure rates associated with the more stringent pass-fail standards for the Vehicle Emissions Testing Program (Section 19 of H.B. 2237). This measure is documented in the Revised Serious Area Carbon Monoxide Plan as "Phased-In Emission Test Cutpoints," beginning on page 8-5; and in the Technical Support Document, beginning on page V-8.

d. Periodic inventories, no later than every three years until attainment of the standard

This requirement was addressed earlier in this section under requirements for Section 172, Nonattainment Plan Provisions. Appendix A, Exhibits 4 and 5, of the Revised 1999 Serious Area Carbon Monoxide Plan contain the 1993 and 1996 periodic emission inventories for the Maricopa County Nonattainment Area. In addition, the Maricopa County Environmental Services Department has completed a carbon monoxide periodic emissions inventory for 1999, the latest version of which was submitted to EPA in August, 2002.

e. Enhanced vehicle inspection and maintenance program

An enhanced vehicle emissions inspection and maintenance program is operated in Area A of Maricopa and Pinal Counties by the Arizona Department of Environmental Quality. The program contains the provisions in Section 182(c)(3) of the Clean Air Act for an Enhanced Vehicle Inspection and Maintenance Program. The State's complete inspection and maintenance program is documented in the Final Arizona State Implementation Plan Revision, Basic and Enhanced Vehicle Emissions Inspection/Maintenance Programs, Volumes 1 and 2, Air Quality Division, Arizona Department of Environmental Quality, June 2001. EPA proposed approval of the Arizona I/M program in August 2002 and signed the final approval notice on October 31, 2002. The final approval notice was published in the Federal Register on January 22, 2003.

f. Attainment demonstration and specific annual emission reductions to demonstrate attainment of the standard

Attainment of the standard was addressed earlier in this chapter based on two consecutive years of clean air quality monitoring data. The Revised Serious Area Carbon Monoxide Plan addresses this requirement in Chapter Nine, Demonstration of Attainment Status.

2. Transportation control measures as required to attain the standard

Section 108(f) of the Clean Air Act contains a list of sixteen transportation control measures which may be considered for reducing air pollution. The Arizona Revised Statutes 49-402 requires that the regional air quality planning agency consider a list of twenty-four measures. Both sets of measures were incorporated into the Draft Comprehensive List (see Table 7-1 in the Revised Serious Area Carbon Monoxide Plan).

A comparison of the Suggested List of Measures for Particulate Matter and Carbon Monoxide with the Section 108(f) Clean Air Act Measures and the measures in State law is presented in Tables 7-2 and 7-3 of the Revised Serious Area CO Plan. From the comparison, it is evident that both sets of measures were considered by the regional air quality planning agency and included in the Suggested List of Measures.

Existing transportation control measures are addressed in the Revised Serious Area Carbon Monoxide Plan in Chapter Five, Overview of Existing Control Measures. New transportation control measures and existing measures which are being strengthened are described in Chapter Eight, The Adopted Plan and Implementation Schedule for the Revised MAG 1999 Serious Area Carbon Monoxide Plan.

3. Oxygenated gasoline during the portion of the year in which the area is prone to high ambient concentrations of carbon monoxide, as is necessary to attain the standard

The Arizona Legislature established a mandatory oxygenated fuels program for the Maricopa County area in 1988. The program was then enhanced with legislation passed in 1991 and 1992. Consequently, all gasoline sold from October 1 through March 30 of each year was required to contain a minimum oxygen content of 2.7 percent by weight. This requirement was met through the sale of ethanol and MTBE gasoline blends (see MAG1993 Carbon Monoxide Plan for the Maricopa County Area, “Mandatory Oxygenated Fuels Program,” on page 4-27).

The Arizona Legislature passed H.B. 2001 in 1993 which required that the oxygen content of all winter gasoline ethanol blends sold in Maricopa County be increased from 7.3 to 10 percent ethanol by volume. Unleaded gasoline-ethanol blends will not contain more than the maximum percentage of oxygen allowed by EPA fuel waiver provisions. The increased oxygen content provisions begin October 1, 1994 through March 31, 1994. This requirement is in effect from October 1 through March 31 of each year thereafter (see the

Revised Serious Area Carbon Monoxide Plan, “Increased Oxygen Content of Ethanol Blends,” page 5-1).

House Bill 2001 also reduced the maximum winter vapor pressure of gasoline fuel sold in Maricopa County from 10 to 9 pounds per square inch beginning October 1, 1994 through March 31, 1994. The requirement is also in effect from October 1 through March 31 of each year thereafter (see the Revised Serious Area Carbon Monoxide Plan, “Reduced Gasoline Volatility,” page 5-1).

The Arizona Legislature passed H.B. 2347 in 1998 which contains requirements for all gasoline produced and shipped to Maricopa County and sold or offered for sale for use in motor vehicles in Area A from and after November 1, 2000 through March 31, 2001 and from the period beginning November 1 through March 31 of each subsequent year. The fuel must comply with the standards for California Phase 2 Reformulated Gasoline, including alternative reformulations allowed by the predictive model, as adopted by the California Air Resources Board, and must meet the maximum vapor pressure requirements of 9 pounds per square inch in A.R.S. 41-2083, Subsections D and F. The fuel must also contain a minimum oxygen content by weight of 3.5 percent as required in A.R.S. 41-2123, Subsection A, Paragraph 2 (see the Revised Serious Area Carbon Monoxide Plan, “Winter Fuel Reformulation: California Phase 2 Reformulated Gasoline with 3.5 Percent Oxygen Content November 1 through March 31,” beginning on page 8-17; and in the Technical Support Document, beginning on page V-5).

Conformity Requirements

In addition to the above requirements, the State Implementation Plan must demonstrate that its provisions are consistent with Section 176(c)(4) conformity requirements. These provisions ensure that federally funded or approved projects and actions and other regionally significant projects conform to the State Implementation Plan prior to the projects or actions being implemented.

State rules for transportation conformity were adopted on April 12, 1995, by the Arizona Department of Environmental Quality, in response to requirements in Section 176(c)(4)(C) of the Clean Air Act as amended in 1990. These rules became effective upon their certification by the Arizona Attorney General on June 15, 1995 and, as required by the federal conformity rule, were submitted to EPA as a revision to the State transportation conformity SIP.

To date, a State transportation conformity SIP has not received approval by EPA. Section 51.390(b) of the federal conformity rule states: “Following EPA approval of the State conformity provisions (or a portion thereof) in a revision to the applicable implementation plan, conformity determinations would be governed by the approved (or approved portion of the) State criteria and procedures.” The federal transportation conformity rule therefore still governs, as a transportation conformity SIP has not yet been approved for this area.

The State rule specifies that Metropolitan Planning Organizations (i.e., MAG, for this region) must develop specific conformity guidance and consultation procedures and processes. MAG has developed and adopted two conformity guidance documents to meet State requirements. MAG developed the "Transportation Conformity Guidance and Procedures" document, which was adopted initially on September 27, 1995 by the MAG Regional Council. The document was revised by the MAG Regional Council on March 27, 1996. This guidance document addresses both the determination of "regional significance" status for individual transportation projects, and the process by which regionally significant projects may be approved.

MAG also developed the "Conformity Consultation Processes" document, which was adopted on February 28, 1996 by the MAG Regional Council. This guidance document details the public and interagency consultation processes to be used in the development of regional transportation plans, programs, and projects within the Maricopa County nonattainment area. Adherence to the above rules, guidance, procedures, and processes ensure that the SIP provisions are consistent with conformity requirements.

CHAPTER THREE

MAINTENANCE PLAN

Section 107(d)(3)(E) of the Clean Air Act stipulates that for a nonattainment area to be redesignated to attainment, Environmental Protection Agency (EPA) must fully approve a maintenance plan which meets the requirements of the Clean Air Act Section 175A. The maintenance plan is a State Implementation Plan (SIP) revision and must provide for maintenance of the relevant National Ambient Air Quality Standards (NAAQS) in the area for at least ten years after redesignation by EPA.

In determining the amount of lead time to allow, EPA indicated that 18 months, as granted in section 107(d)(3)(D) of the Clean Air Act, should be assumed for EPA to approve a redesignation request. Due to uncertainties regarding the time that the area will be redesignated to attainment, the year 2015 was modeled to assure that the 8-hour carbon monoxide NAAQS is maintained at least ten years past an official notice of redesignation to attainment by EPA.

The EPA has established the core elements listed below as necessary for approval of maintenance plans.

1. Description of the control measures for the maintenance period
- Emission inventories for base and future years
- Maintenance demonstration
- Mobile source emissions budget
- Approved monitoring network
- Verification of continued attainment
- Contingency plan
- Subsequent maintenance plan revisions

MAINTENANCE PLAN CONTROL MEASURES

Generally, the overall approach taken in preparing the Maintenance Plan is to demonstrate maintenance of the carbon monoxide standard in 2015 with the committed measures in the Revised MAG 1999 Serious Area Carbon Monoxide Plan. Therefore, the Maintenance Plan relies heavily upon the Revised MAG 1999 Serious Area Carbon Monoxide Plan and its supporting documents, including the commitments to implement control measures.

The primary purpose of conducting areawide modeling is to demonstrate control strategy effectiveness in maintaining the 8-hour Carbon Monoxide National Ambient Air Quality Standards (NAAQS) for at least ten years after the Maricopa County Nonattainment area has been redesignated to attainment status. The committed control measures included in this plan are the same measures included in the Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area (March 2001). However, two committed contingency measures in the Revised Carbon Monoxide Plan have become committed maintenance measures in the maintenance plan. In addition,

although not quantified in the Revised Serious Area Carbon Monoxide Plan, Off Road Vehicle and Engine Standards is a maintenance measure for which emission reduction credit has been taken in the Maintenance Plan.

It should be noted that two contingency measures in the Revised Carbon Monoxide Plan, the Voluntary Lawn Mower Emission Reduction Program and the Catalytic Converter Replacement Program, are not included in the Maintenance Plan. The Arizona Legislature did not provide additional funding for the Voluntary Lawn Mower Emission Reduction Program in 2001. In addition, on January 12, 2003, the Arizona Republic reported that the State's Clean Air Fund could be used to help reduce the State's FY 2003 budget deficit. Since the Clean Air Fund provides support for the Catalytic Converter Replacement Program, there is a possibility that this program could be eliminated for one or more years. Since funding of the Program is uncertain, MAG modeled the interim year of 2006 and the 2015 maintenance demonstration without assuming emission reduction credit for this measure.

In addition, the LEV program included in the Revised Serious Area Carbon Monoxide Plan as a contingency measure is no longer a control measure in the maintenance plan. This is because the maintenance plan modeling effort incorporates vehicle emission factors from the EPA MOBILE6 model, which includes the effects of the National LEV program by default. In the case of the Revised Serious Area Carbon Monoxide Plan, the MOBILE5a model was utilized. Since MOBILE5a did not include the National LEV program by default, the benefits of the program were included as a contingency measure in that plan.

Descriptions of the committed control measures in the Maintenance Plan are organized in three groups below. The first group of measures includes those for which numeric credit is assumed in the maintenance demonstration. The combined emission reduction impact of this group of measures, described as maintenance measures, is reflected in the 2006 and 2015 modeling inventories described in Section VII-3 of the Technical Support Document. Two contingency measures and one measure not quantified in the Revised Serious Area Carbon Monoxide Plan are included in this first group of maintenance measures. The modeling methodologies for the measures in this group are summarized in Section VII-2 of the Technical Support Document, with more detailed descriptions provided in Appendix VII of the Technical Support Document.

The second group of measures includes the committed measures that are part of the contingency plan described in Section VII-5 of the Technical Support Document. For these measures, a benefit is quantifiable, but no credit was taken in the maintenance demonstration. The impact of these measures is not reflected in the 2006 or 2015 modeling inventories.

The third group of measures includes additional measures for which commitments were received in the Revised Serious Area Carbon Monoxide Plan, but numeric emission reduction credit was not taken. The impacts of these measures are not readily quantifiable. However, these measures represent additional legally-enforceable commitments to reduce emissions and improve air quality in the region.

A summary of the committed maintenance and contingency measures taken for numeric credit is provided in Table 3-1. For comparison purposes, Table 3-1 also indicates the status of these measures in the Revised Serious Area Carbon Monoxide Plan (i.e., whether they were attainment, contingency, or not-quantified measures).

The general approaches used to model the emission reductions from the individual measures are similar to those used in the Revised Serious Area Carbon Monoxide Plan. Figure 3-1 illustrates the emission reduction impact of the individual maintenance measures in 2015. Table 3-2 quantifies the emission reductions from the committed maintenance measures in metric tons per day. Figure 3-2 illustrates the emission reduction impact of the individual contingency measures in 2000. The emission reductions are shown for the year 2000, because contingency measures can be triggered in accordance with the provisions of the Contingency Plan anytime after 2000.

Measures Used for Numeric Credit

The nine committed measures assumed in modeling maintenance of the eight-hour carbon monoxide standard through 2015 are described in Chapter Two. Figure 3-1 identifies the emission reduction credit for each of the individual maintenance measures. Although not quantified in the Revised Carbon Monoxide Plan, Off Road Vehicle and Engine Standards, is a maintenance measure for which emission reduction credit has been taken in the maintenance plan. Two of the maintenance measures were formerly contingency measures in the Revised Serious Area Carbon Monoxide Plan. These include Tougher Enforcement of Vehicle Registration and Emission Test Compliance and Clean Burning Fireplace Ordinances. Table 3-1 summarizes the maintenance measures and identifies their comparable status in the Revised Serious Area Carbon Monoxide Plan. These measures are described in detail in Section VII-2-1 of the Technical Support Document.

Measures Included in the Contingency Plan

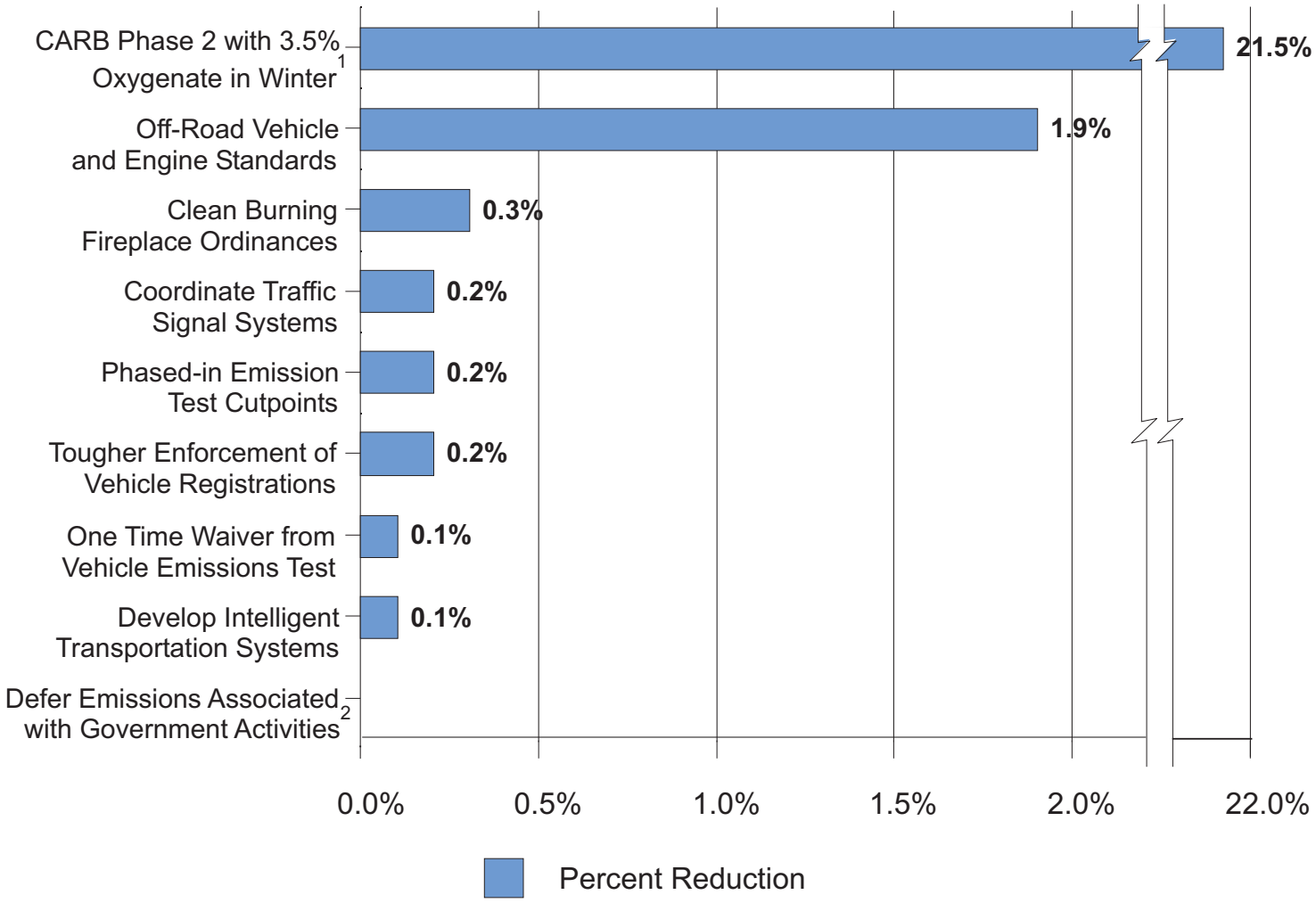
Expansion of Area A Boundaries, Gross Polluter Option for I/M Program Waivers, and Increase Waiver Repair Limit Options are contingency measures in both the Revised Serious Area Carbon Monoxide Plan and the Carbon Monoxide Maintenance Plan. These measures are described in Chapter VII of the CO Maintenance Plan TSD. Figure 3-2 identifies the emission reduction credit for each of the individual contingency measures in 2000. The emission reductions are shown for the year 2000, because contingency measures can be triggered in accordance with the provisions of the Contingency Plan anytime after 2000. These three contingency measures have already been implemented in the nonattainment area. Early implementation of contingency measures is allowed by EPA and helps to ensure that the standard will be maintained through 2015. The Contingency Provisions in this Chapter identify procedures that will be followed to consider and implement additional contingency measures, as needed.

TABLE 3-1

COMMITTED MEASURES USED FOR NUMERIC CREDIT IN THE CARBON MONOXIDE MAINTENANCE PLAN

Measures Used for Numeric Credit in the Carbon Monoxide Maintenance Plan	Status in the Carbon Monoxide Maintenance Plan	Status in the Revised Serious Area CO Plan
• CARB Phase 2 with 3.5% Oxygenate in Winter	Maintenance Measure	Attainment Measure
• Phased-In Emission Test Cutpoints	Maintenance Measure	Attainment Measure
• One-time Waiver from Vehicle Emissions Test	Maintenance Measure	Attainment Measure
• Defer Emissions Associated with Government Activities	Maintenance Measure (affects timing rather than magnitude of emissions)	Attainment Measure
• Coordinate Traffic Signal Systems	Maintenance Measure	Attainment Measure
• Develop Intelligent Transportation Systems	Maintenance Measure	Attainment Measure
• Tougher Enforcement of Vehicle Registration and Emission Test Compliance	Maintenance Measure	Contingency Measure
• Catalytic Converter Replacement Program	Removed Due to Uncertain Funding	Contingency Measure
• Clean Burning Fireplace Ordinances	Maintenance Measure	Contingency Measure
• Off-Road Vehicle and Engine Standards	Maintenance Measure	Not-Quantified Measure
• National Low Emission Vehicle Program	Assumed in MOBILE6 by Default	Contingency Measure
• Expansion of Area A Boundaries	Contingency Measure	Contingency Measure
• Gross Polluter Option for I/M Program Waivers	Contingency Measure	Contingency Measure
• Increase Waiver Repair Limit Options	Contingency Measure	Contingency Measure
• Lawn Mower Reduction Program	Removed Due to Uncertain Funding	Contingency Measure

FIGURE 3-1
2015 CARBON MONOXIDE EMISSION REDUCTIONS FROM INDIVIDUAL MAINTENANCE MEASURES
(Percent Reduction in Total Emissions)



[1]Of the 21.5 percent reduction in emissions, the majority (21.1 percent) is due to the low sulfur content of the fuel.

[2]This measure influences when emissions occur rather than their magnitude; 6 percent of emissions from two-stroke gasoline-powered engines used by public agencies were shifted from post-2 p.m. period to the pre-2 p.m. period on the modeled week day.

NOTE: Individual impact of measures are not additive.

TABLE 3-2

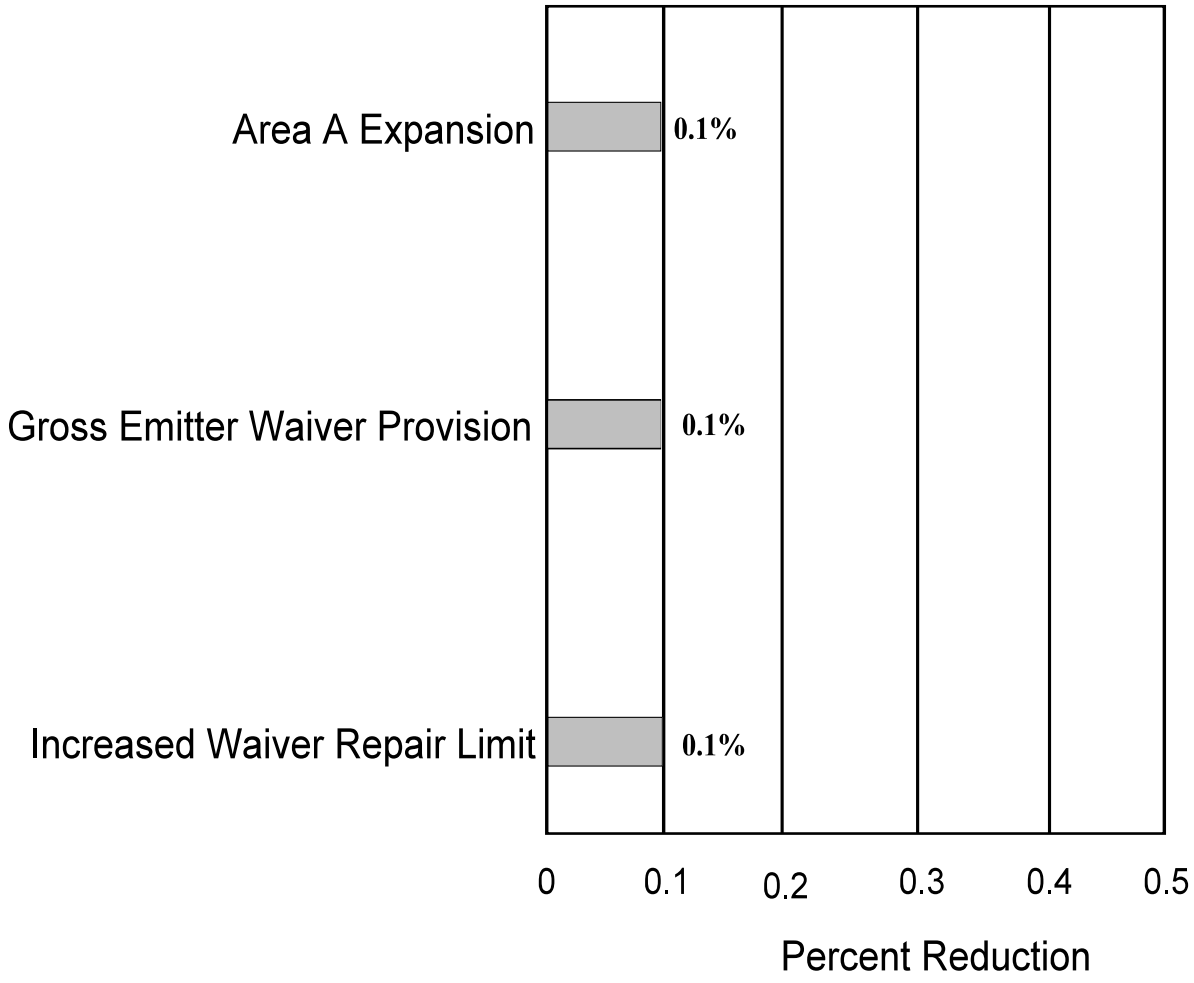
SUMMARY OF 2015 CARBON MONOXIDE EMISSION REDUCTIONS FROM COMMITTED MAINTENANCE MEASURES USED FOR NUMERIC CREDIT

2015 Emissions Without Maintenance Measures (metric tons/day)	1253.5	
Maintenance Measure	**Emission Reductions (metric tons/day)**	**Percent Reduction in Emissions**
CARB Phase 2 with 3.5% Oxygenate in Winter[1]	269.7	21.5%
Off-Road Vehicle and Engine Standards	24.18	1.9%
Clean Burning Fireplace Ordinances	3.82	0.3%
Coordinate Traffic Signal Systems	2.98	0.2%
Phased-in Emission Test Cutpoints	2.92	0.2%
Tougher Enforcement of Vehicle Registrations	2.25	0.2%
One-time Waiver from Vehicle Emissions Test	1.51	0.1%
Develop Intelligent Transportation Systems	0.89	0.1%
Defer Emissions Associated with Government Activities[2]	0.0	0.0%

[1]Of the 21.5 percent reduction in emissions, the majority (21.1 percent) is due to the low sulfur content of the fuel.

[2]Affects timing rather than magnitude of emissions.

FIGURE 3-2
CARBON MONOXIDE EMISSION REDUCTIONS
FROM INDIVIDUAL CONTINGENCY MEASURES IN 2000
(Percent Reduction in Total Emissions)



The contingency measures are described in detail in Section VII-2-2 of the Technical Support Document. It is also important to note that two contingency measures in the Revised Serious Area Carbon Monoxide Plan, Tougher Enforcement of Vehicle Registration and Emission Test Compliance and Clean Burning Fireplace Ordinances, are maintenance measures in the Maintenance Plan.

Two other contingency measures in the Revised Serious Area Carbon Monoxide Plan, Voluntary Lawn Mower Emission Reduction Program and Catalytic Converter Replacement Program, are not included in the Maintenance Plan, because funding for these programs after 2000 is uncertain. Table 3-1 summarizes the maintenance and contingency measures in the Maintenance Plan and identifies their comparable status in the Revised Serious Area Carbon Monoxide Plan.

Measures Which Improve Air Quality, But Were Not Used for Numeric Credit

The third group represents measures that were not quantified for emission reduction credit, but are committed measures in both the attainment and maintenance plans. These non-quantified measures are described in detail in Section VII-2-3 of the Technical Support Document.

EMISSION INVENTORIES

This section summarizes the base year 1994, the interim year 2006, and the maintenance year 2015 carbon monoxide (CO) emission inventories for use in the Urban Airshed Model (UAM) simulations. The emissions inventories include onroad mobile, point, area, aviation, and nonroad mobile sources. The onroad mobile emissions are the major source of CO emissions in the Maricopa County Nonattainment Area.

The 1994 inventory was developed for December 16-17 and reflected control measures in place at that time. The future year emission inventories include projected emission reductions resulting from committed control measures that were implemented after 1994. Sections III-1 and VII-3 of the Technical Support Document documents the technical details of the CO emission inventories for 1994, 2006 and 2015.

Demographic and Transportation Data

Growth factors for the future years were based on the latest population projections approved by the MAG Regional Council in June 1997 and developed from the 1995 Special Census. The 2006 and 2015 employment growth factors by Standard Industrial Classification (SIC) were based on projections prepared by the Arizona Department of Economic Security (DES) in August 1997.

The 2006 and 2015 emissions from all sources, except peaking power plants and aircraft, were increased by six and fifteen percent, respectively. These increases were applied

regardless of hour of the day or location in the modeling domain, because of an expected increase in population and employment projections for the State. The DES is in the process of developing new population projections for the State and counties based on the 2000 Census. These projections will not be available from DES until sometime in mid-2003. However, preliminary data indicate that the new population projections will be about six and fifteen percent higher, respectively, than previous 2006 and 2015 projections for Maricopa County.

Summary of the Emission Inventories

The 1994 base case, 2006 interim year, and 2015 maintenance year emission inventories for carbon monoxide are summarized in Table 3-3. In all three inventories, onroad mobile source emissions represent the largest source of CO emissions in the modeling domain: 83 percent of total emissions in 1994, 77 percent, in 2006 and 74 percent, in 2015.

With the implementation of the committed maintenance measures and stricter Federal controls on vehicles and fuels, onroad mobile emissions decrease by 19.5 percent between 1994 and 2006, and another 5.3 percent between 2006 and 2015. (See Table 3-4 (a)). Area source emissions increase 41.4 percent between 1994 and 2006, and another 21.9 percent between 2006 and 2015, due to anticipated growth in regional population. Between 1994 and 2015, point source emissions increase almost twelve-fold, as a result of expected increases in power plant emissions. Nonroad mobile source emissions increase about ten percent between 1994 and 2015, because control measures do not fully offset growth in the number of nonroad engines. With implementation of the committed maintenance measures, total emissions decrease by thirteen percent between 1994 and 2006, and another one percent between 2006 and 2015.

MAINTENANCE DEMONSTRATION

To demonstrate maintenance of the 8-hour carbon monoxide NAAQS, the results from the urban airshed modeling analyses should not show predicted 8-hour maximum carbon monoxide concentrations greater than 9.0 ppm anywhere in the modeling domain for the episode modeled. The maintenance demonstration follows the deterministic procedure prescribed in the EPA Guideline.

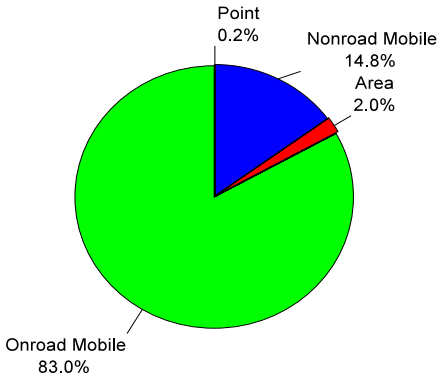
UAM Analysis

The purpose of future year simulations is to illustrate the effects of projected emission changes on simulated air quality for a given episode. Comparison of the base and future year emission totals indicates that total carbon monoxide emissions for 2015 are 14.0 percent lower than the 1994 emissions estimates for the first simulation day and 12.6 percent lower for the second simulation day (see Tables 3-4(a) and 3-4(b)). The 1994, 2006, and 2015 maximum simulated carbon monoxide eight-hour concentrations are provided in Table 3-5 for comparison.

TABLE 3-3

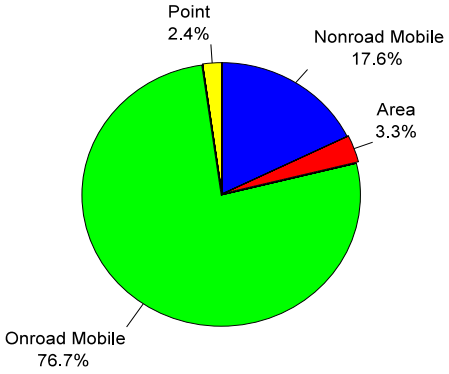
1994 BASE CASE AND 2006 AND 2015 COMMITTED MAINTENANCE MEASURE EMISSIONS

Friday, December 1994		
Source Category	Metric Tons per Day	Percent
Point	2.5	0.2
Area	21.0	2.0
Nonroad Mobile	155.1	14.8
Onroad Mobile	869.6	83.0
Total	1048.2*	100.0*



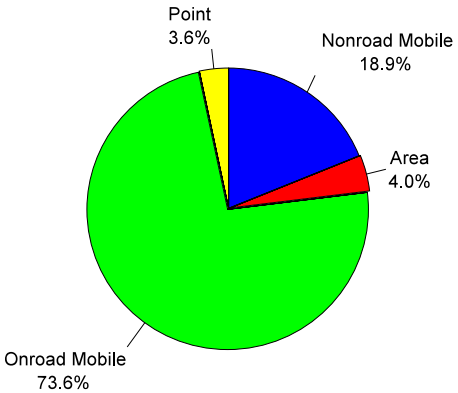
December 1994

Friday, December 2006		
Source Category	Metric Tons per Day	Percent
Point	21.9	2.4
Area	29.7	3.3
Nonroad Mobile	161.0	17.6
Onroad Mobile	699.7	76.7
Total	912.3*	100.0*



December 2006

Friday, December 2015		
Source Category	Metric Tons per Day	Percent
Point	32.2	3.6
Area	36.2	4.0
Nonroad Mobile	169.9	18.9
Onroad Mobile	662.9	73.6
Total	901.2*	100.0*



December 2015

*Note that the sum of the source categories may not equal 100.0 percent due to rounding.

TABLE 3-4(a)
EMISSION TOTALS FOR A FRIDAY IN DECEMBER
(METRIC TONS/DAY)

Source	1994	2006	2015	1994-2006 Change (%)	1994-2015 Change (%)
Point	2.5	21.9	32.2	776.0	1188.0
Area	21.0	29.7	36.2	41.4	72.4
Nonroad Mobile	155.1	161.0	169.9	3.8	9.5
Onroad Mobile	869.6	699.7	662.9	-19.5	-23.8
Total	**1048.2**	**912.3**	**901.2**	**-13.0**	**-14.0**

TABLE 3-4(b)
EMISSION TOTALS FOR A SATURDAY IN DECEMBER
(METRIC TONS/DAY)

Source	1994	2006	2015	1994-2006 Change (%)	1994-2015 Change (%)
Point	2.5	21.3	31.5	752.0	1160.0
Area	21.3	27.7	35.3	30.1	65.7
Nonroad Mobile	207.7	203.1	208.1	-2.2	0.2
Onroad Mobile	538.1	494.7	398.0	-8.1	-26.0
Total	**769.6**	**746.8**	**672.9**	**-3.0**	**-12.6**

TABLE 3-5
THE 1994, 2006 AND 2015 MAXIMUM SIMULATED EIGHT-HOUR CARBON MONOXIDE CONCENTRATIONS FOR THE DECEMBER 16-17 EPISODE

Year	Regional Maximum Simulated Eight-hour Concentration (ppm)	Location
1994	10.71	(15,13)
2006	8.92	(14,13)
2015	8.06	(14,13)

The 2006 and 2015 maximum simulated carbon monoxide concentrations are lower than in 1994 for the episode (8.92 and 8.06 ppm, respectively, compared to 10.71 ppm for 1994). The Quality Assurance and Diagnostic Analyses and Performance Evaluation for the UAM runs are documented in Chapters III and VI, respectively, of the Carbon Monoxide Maintenance Plan Technical Support Document.

Microscale Analysis

The microscale analyses performed for the 2006 interim year and 2015 committed maintenance measure package were performed using the same general methodology as for the 1994 base case analysis. The microscale analyses are documented in Chapter V of the Carbon Monoxide Maintenance Plan Technical Support Document.

For the 2006 and 2015 microscale analyses, the traffic volumes were updated to reflect the 2015 time frame and emission factors from the EPA mobile model were updated to reflect the appropriate future year and effects of the committed measures. In addition, the overall configuration of the Thomas Road/Grand Avenue/27th Avenue intersection was updated to reflect a "fly-over" expected to be completed by the end of 2003.

Combined UAM/CAL3HQC Results

The modeling results showed maintenance of the NAAQS for carbon monoxide in 2006 and 2015 for the Maricopa County nonattainment area, since the simulated CO concentrations are all below 9 ppm. The maximum carbon monoxide modeled concentrations at the grid cells where the receptors for the hot spots were located in 1994 are summarized in Table 3-6. The simulated maximum carbon monoxide concentration is 8.92 ppm in 2006 and 8.06 ppm in 2015.

MOBILE SOURCE CARBON MONOXIDE EMISSIONS BUDGETS

In accordance with the 1990 Clean Air Act Amendments, conformity requirements are intended to ensure that transportation activities do not result in air quality degradation. Section 176 of the Clean Air Act requires that transportation plans, programs, and projects conform to applicable air quality plans before the transportation action is approved by a Metropolitan Planning Organization (MPO). The designated MPO for the Maricopa County area is MAG.

Section 176(c) of Clean Air Act provides the framework for ensuring that Federal actions conform to air quality plans under section 110. Conformity to an implementation plan means that proposed activities must not (1) cause or contribute to any new violation of any standard in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

TABLE 3-6
COMBINED UAM/CAL3QHC 2006 AND 2015 MAXIMUM EIGHT-HOUR CARBON MONOXIDE CONCENTRATIONS (PPM) FOR THE DECEMBER 16-17 EPISODE

In 2006

Location	UAM Grid Cell	UAM Concentration	CAL3QHC Concentration	Total	Ending Hour
WISR Monitor	(11,15)	7.22	0.06	7.28	0300
WISR Receptor # 9	(11,15)	7.17	1.08	8.25	0200
WISR Receptor # 8	(11,15)	7.17	0.91	8.08	0200
WISR Receptor # 20	(11,15)	7.17	0.68	7.85	0300
PHGA Monitor *	N/A	N/A	N/A	0.00	N/A
PHGA Receptor # 30	(12,15)	7.74	0.50	8.24	0300
PHGA Receptor # 29	(12,15)	7.89	0.19	8.08	0300
PHGA Receptor # 46	(12,14)	7.74	0.29	8.03	0300
UAM Maximum	(14,13)	8.92	-	8.92	0400

In 2015

Location	UAM Grid Cell	UAM Concentration	CAL3QHC Concentration	Total	Ending Hour
WISR Monitor	(11,15)	6.56	0.03	6.59	0300
WISR Receptor # 9	(11,15)	6.23	1.81	8.04	0200
WISR Receptor # 8	(11,15)	6.23	1.61	7.84	0200
WISR Receptor # 20	(11,15)	6.56	0.88	7.44	0300
PHGA Monitor *	N/A	N/A	N/A	0.00	N/A
PHGA Receptor # 30	(12,15)	7.16	0.65	7.81	0300
PHGA Receptor # 29	(12,15)	7.16	0.29	7.45	0300
PHGA Receptor # 46	(12,14)	7.19	0.20	7.39	0300
UAM Maximum	(14,13)	8.06	-	8.06	0400

WISR = West Indian School Road monitor
PHGA=Phoenix Grand Avenue monitor

* Due to the reconfiguration of the PHGA intersection, the location of the actual monitor at that intersection in future years is unknown.

EPA transportation conformity regulations (August 1997) establish criteria involving comparison of projected transportation plan emissions with the motor vehicle emissions assumed in applicable air quality plans. The regulations define the term “motor vehicle emissions budget” as meaning “the portion of the total allowable emissions defined in a revision of the applicable implementation plan (or in an implementation plan revision which was endorsed by the Governor or his or her designee) for a certain date for the purpose of meeting reasonable further progress milestones or attainment or maintenance demonstrations, for any criteria pollutant or its precursors, allocated by the applicable implementation plan to highway and transit vehicles.”

The transportation conformity budget for carbon monoxide was established in Chapter Nine of the Revised Serious Area Carbon Monoxide Plan in the section, Motor Vehicle Emissions Budget for Conformity. The budget was established at 412.2 metric tons per day for 2000 for the modeled area. EPA issued a notice of adequacy in the Federal Register on October 17, 2001, finding that this budget was adequate for transportation conformity purposes. This budget will be used in MAG transportation conformity analyses until the maintenance plan is approved or the maintenance budgets are found to be adequate. At that time, new transportation conformity budgets for carbon monoxide will be established for 2006 and 2015 for use in subsequent conformity analyses.

The projections in this Maintenance Plan indicate that the daily carbon monoxide emissions in 2006 and 2015 would be 912.3 and 901.2 metric tons per day, respectively, with the committed maintenance measures, which includes an onroad mobile source contribution of 699.7 metric tons per day in 2006 and 662.9 metric tons per day in 2015 (from Table 3-3). The total onroad mobile source emissions of 662.9 metric tons per day represents the motor vehicle emissions conformity budget for carbon monoxide in 2015. Since 2006 was also modeled, the Maintenance Plan establishes an interim motor vehicle emissions conformity budget for carbon monoxide of 699.7 metric tons per day in 2006. The 2006 and 2015 emission inventories used to establish the mobile source emissions budgets are documented in Appendix VII of the CO Maintenance Plan TSD.

After EPA finds the maintenance budgets to be adequate or approves the maintenance plan, MAG will apply the provisions of the EPA transportation conformity regulations (August 15, 1997), 40 CFR Part 93 Section 93.118(b). This Maintenance Plan establishes motor vehicle emissions budgets for the maintenance year of 2015 and the interim year of 2006. In accordance with 40 CFR Part 93 Section 93.118(b), MAG will use the new interim mobile source carbon monoxide emissions budget for the conformity horizon years of 2006 through 2014 and the new 2015 mobile source carbon monoxide emissions budget for conformity horizon years after 2014.

Onroad mobile source emissions for 2006 and 2015 were developed by MAG using the EPA-approved MOBILE6 model and Highway Performance Monitoring System (HPMS) reconciliation methodology. Documentation of the HPMS reconciliation methodology and an EPA approval letter are contained in Appendix III-iv of the Technical Support Document.

After the new 2006 and 2015 motor vehicle emissions budgets are found to be adequate or are approved by EPA for conformity purposes, MAG will apply MOBILE6 and the HPMS reconciliation procedure to estimate onroad mobile source emissions for the conformity horizon years of 2006 and beyond.

MONITORING NETWORK / VERIFICATION OF CONTINUED ATTAINMENT

Air quality monitoring data in Maricopa County confirm that the attainment date of December 31, 2000 was met, since no violation of the CO standard has occurred at any monitor since 1996. As a result of the "clean" data at the monitors, the State of Arizona requested a carbon monoxide attainment determination from EPA on July 23, 1999.

Once the Maricopa County Nonattainment Area has been redesignated to attainment status by EPA, the Arizona Department of Environmental Quality (ADEQ) and the Maricopa County Environmental Services Department (MCESD) will continue to operate an appropriate air quality monitoring network of National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS) monitors in accordance with 40 CFR Part 58 to verify the continued attainment of the carbon monoxide standard. If measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) change significantly over time, ADEQ and MCESD will perform the appropriate studies to determine whether additional and/or re-sited monitors are necessary. Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

In order to track the progress of the maintenance plan, periodic emission inventories will also be prepared every three years in accordance with Section 187(a)(5) of the Clean Air Act. Maricopa County will coordinate and compile the inventory with input and assistance from the Arizona Department of Environmental Quality, Arizona Department of Transportation, and Maricopa Association of Governments, as described in the 1992 Air Quality Memorandum of Agreement. Changes in the inventory will be reviewed and evaluated through the regional air quality planning process to determine if additional measures should be considered.

CONTINGENCY PROVISIONS

Section 175A(d) of the Clean Air Act requires that maintenance plans contain contingency provisions. EPA guidance on the required content of the contingency plan is provided in the September 4, 1992 EPA memorandum. This memo indicates that the contingency plan is not required to contain fully adopted contingency measures. However, the plan should contain clearly identified contingency measures to be adopted, a schedule and procedure for adoption and implementation, and a specific time limit for action by the State. In addition, specific indicators should be identified which will be used to determine when the contingency measures need to be implemented. The Maintenance Plan addresses each of these requirements for an approvable contingency plan.

Consistent with the August 13, 1993 EPA guidance memorandum titled, "Early Implementation of Contingency Measures for Ozone and Carbon Monoxide (CO) Nonattainment Areas", the contingency plan described in the maintenance plan is comprised of committed control measures that are expected to be implemented early. Early implementation of contingency measures in a maintenance plan has been approved by EPA in the redesignation of the Salt Lake City Carbon Monoxide Nonattainment Area to attainment (see page 3216 of the January 21, 1999 Federal Register). In that action, EPA noted that both contingency measures in the Salt Lake City contingency plan had already been partially implemented.

The three contingency measures in the Maintenance Plan are Area A Expansion, Gross Polluter Option for I/M Program Waivers, and Increased Waiver Repair Limit Options. Emissions reduction credit for these contingency measures was not taken in the maintenance demonstration.

A description of these individual measures is provided in Section VII-2-2 of the Technical Support Document. Figure 3-2 provides the emission reductions in 2000 for the individual contingency measures. Early implementation of these contingency measures provides additional confidence that the carbon monoxide standard will be maintained through 2015.

The success of an air quality program is measured by the concentrations recorded at the monitors. In order to ensure that violations of the CO standard do not occur in the future, ambient air quality monitoring data will be examined to determine if additional contingency measures are needed. Two verified readings exceeding 9.0 ppm at two or more SLAMS or NAMS monitors during a single carbon monoxide season (i.e. October 1 through March 31) will trigger consideration of additional measures, which may include the strengthening of contingency measures shown in Figure 3-2. Since a violation of the NAAQS for eight-hour carbon monoxide occurs when the second highest reading at the same monitor over two consecutive years is greater than or equal to 9.5 ppm, this trigger is more stringent than the standard and will serve to prevent the occurrence of future violations. When the trigger is activated, additional measures would be considered on the following schedule: (A) verification of the monitoring data to be completed three months after activation of the trigger; (B) applicable measure to be considered for adoption six months after date established in A above; and (C) resultant committed measure to be implemented within six to twelve months, depending upon the time needed to put the measure in place.

SUBSEQUENT MAINTENANCE PLAN REVISIONS

It is required that a maintenance plan revision be submitted to the EPA eight years after the original redesignation request/maintenance plan is approved. The purpose of this revision is to provide for maintenance of the carbon monoxide NAAQS for an additional ten years following the first ten-year period. As the designated Regional Air Quality Planning Agency for the Maricopa County area, the Maricopa Association of Governments intends to prepare a revised maintenance plan eight years after redesignation to attainment, as required by the Clean Air Act and the Environmental Protection Agency.